Osteopathic Treatment During Transition of Perimenopause

Angelika Mückler, DO
Vienna 2005

Table of contents

Abstract

BACKGROUND AND AIM: Perimenopause and menopause are still widely regarded as illnesses. There is little research on alternative approaches which could lend support to women in this very sensitive time of transition.
Osteopathy is a holistic way of treating women individually and of stimulating self-regulatory forces of the body. This study wants to show how osteopathic treatment can influence quality of life and menopausal complaints during the transition of perimenopause.

METHODS: For a period of three months 13 healthy women with menopausal complaints underwent a total of three tests on quality of life (SF-36) and menopausal complaints (MRS II) and received two osteopathic treatments. Changes in health perception during the first six.weeks (=control group) were compared with the changes during the second six weeks (=treatment group).

RESULTS: During the whole period of observation there was a clear trend towards improvement of complaints and during treatment there was no trend towards decline. All the women showed in individually different areas clear improvement in their health perception.

CONCLUSIONS: With osteopathic treatment menopausal complaints can be reduced in individually different ways and quality of life can be improved. It is not possible to establish a common pattern; the effect seems to be different for each individual woman. Larger sample surveys and longer observation periods would be necessary in order to obtain statistically significant results.

Keywords: perimenopause – osteopathy – quality of life – menopausal / climacteric complaints

Author:
Angelika Mückler, dipl. PTH, DO
A-1200 Wien, Handelskai 102-112 / 4 / 10
Tel.: +43-1-3342844
E-Mail: a.mueckler@utanet.at

1. Introduction

1.1 Presentation of the problem

Time and again in my osteopathic work I observe that climacteric problems disappear when the patient's general state of health improves by osteopathic treatment, or if troubles which were the reason for the treatment subside.

There are two reasons which compelled me to choose this topic for my thesis and to systematise my observations: first the experience that osteopathy is an efficient therapeutic measure for crises, because it stimulates self-healing and self-regulatory forces of the organism. Dr A. T. Still coined the following: "He *(the osteopath)* seeks the cause, removes the obstruction and lets Nature's remedy - arterial blood – be the doctor". (Quoted from Still A.T. : Osteopathy Research and Practice. Eastland Press 1992, paragraph 5); the second reason was that perimenopause is the next change I will undergo and it seemed only natural for me to be well informed and prepared for this transition.

The aim of this study is to find out if typical problems of perimenopause decrease, when women suffering from such troubles undergo osteopathic treatment.

To my knowledge no research into osteopathic treatment of perimenopausal problems has been conducted so far. Standard literature of osteopathy rarely deals with the problem of menopause (1) or in a perfunctory way only.
In my opinion this is a shortcoming and something has to be done about it.

Osteopathy is a holistic, therapeutic concept taking into account the individuality of each woman undergoing the transition of menopause (osteopathy is an independent system and can be applied to all conditions of disease, ... : Still, A.T. : Osteopathy Research and Practice. Eastland Press, 1992, paragraph 21).
With osteopathic treatment we can strengthen self-regulatory forces of the organism (2), and devise a "tailor-made" treatment for each patient. If general health or the healthy parts of the body are additionally strengthened, the patient can more easily adapt to all the physiological changes of perimenopause.
I conducted the study with women in perimenopause because there are more complaints in this transitional time than in postmenopause (3,4).Transitional times are times of crisis with a high potential both of negative and positive changes (5). Osteopathic treatment can lead to better health in a new chapter of life. This support may enable a woman with climacteric complaints not to perceive this transition as a menace but to accept it as a chance for change (5).

I would like to show that osteopathy is a good way of supporting patients individually in times of crisis or change. Apart from the treatment, which is adapted to each individual patient's needs, specific osteopathic techniques offer the possibility of correction directly at those zones which set off the symptoms:

- Visceral techniques to harmonise the lower abdominal organs, in particular the suspension system of the urogenital tract.
- Craniosacral techniques for the control centre of the central nervous system (e.g. the areas of pituitary gland and hypothalamus).
- Structural techniques to improve the hormonal axis going along hypothalamus, pituitary gland, thyroid gland, adrenal gland and ovaries, in particular blood supply to hormonal glands (1).

Independent of the research issue and my personal interest in this question there is a third criterion which made me choose a topic of specific women's interest:

I work as an osteopath in a group practice of general practitioners, osteopaths, a clinical psychologist, a psychotherapist and family counsellors. It is located in a Vienna district with a high percentage of working class people and foreigners and cares mainly for people from the immediate environment. Many of our patients are very interested in special services like osteopathy but cannot pay for them which means that they only go for services covered by national health insurance or the services provided free of charge by the family counselling centre.
This study gave me the possibility to offer osteopathic treatment free of charge to women who could otherwise not afford it.

1.2 Background of the study

Background literature and research literature (see appendix)
Research was mainly conducted via Internet.

Definitions:

Menopause:
Menopause is a defined point of time and describes the permanent cessation of menstruation. It is clinically diagnosed retrospectively after 12 months of amenorrhea. On average, women experience menopause at age 51 (6). Epidemiological studies reveal that menopause occurs earlier with heavy smokers and later with women who have borne children. Adhesions in the pelvis e.g. after surgery (7) seem to predispose women to premature menopause. The age of menopause of female relatives is highly indicative of your own age of menopause (7, 8).

Postmenopause:
Postmenopause is the phase of life after your last menstrual bleeding.

Perimenopause:
Perimenopause encompasses the time between normal cycles and menopause. This transition usually lasts four years with Caucasian women. It starts with a dysregulation of the neurohormonal system. Menstruation cycles become irregular: the length of time between cycles varies. Disruption of follicular maturation occurs. There are cycles with ovulation and others without ovulation. Estradiol levels in the serum vary (sometimes they are even higher than standard levels). Gonadotropin levels (FSH – follicle-stimulating-hormone and LH – luteinizing hormone) are raised but they can vary. Progesterone (PRG) level goes down (except for normal cycles which become less frequent). Serotonin, noradrenaline and b-endorphin concentrations diminish. Typical symptoms are irregularity of bleeding (polymenorrhea, oligomenorrhea), autonomic changes, weight gain, heart palpitations, achy joints and psychological symptoms (6,7,9).
This transition prepares any woman for one of the major changes in her life: cessation of fertility. Profound physical, psychological and social changes take place. Each major and / or complex change is a crisis with potentially negative and positive aspects and presents a major strain for the person undergoing it (32).
Today menopause is not regarded any more as just the exhaustion of primordial follicles. By now doctors know that age-related changes of the central nervous system additionally cause changes in the axis of hypothalamus-pituitary gland-gonad (3).

1.3 Physiological principles

Gonadal axis (Fig. 1)

Without the perfect function of the complete gonadal axis there will be no normal ovarian cycle. The ovary seems to play the active part by starting and directing the course of cycle ("pelvic clock")

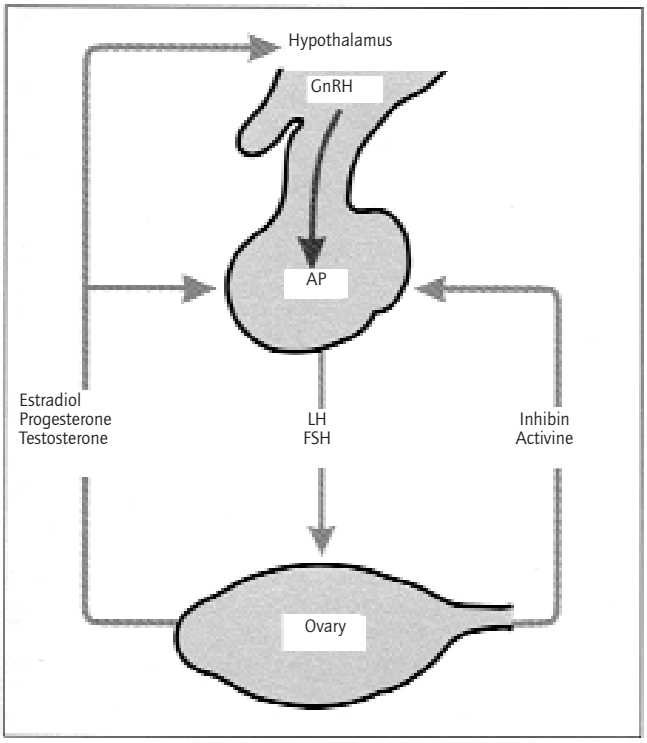


Fig. 1: Hormonal feedback system of female gonadal axis (AP=anterior pituitary)

GnRH (gonadotropin-releasing-hormone) – pulse generator (9):

The crucial interface between body, environment and reproductive axis or control of ovarian activity lies in the synthesis and secretion of GnRH which takes place in the median eminence. Via portal circulation the hormone reaches the anterior lobe of the pituitary gland. Secretion is rhythmic. Pulsation is most probably generated in the arcuate nucleus (infundibular nucleus) and in the vascular organ of lamina terminalis. Frequency of GnRH-secretion is more important than magnitude since frequency determines whether FSH or LH is more readily released **(Fig. 2).**

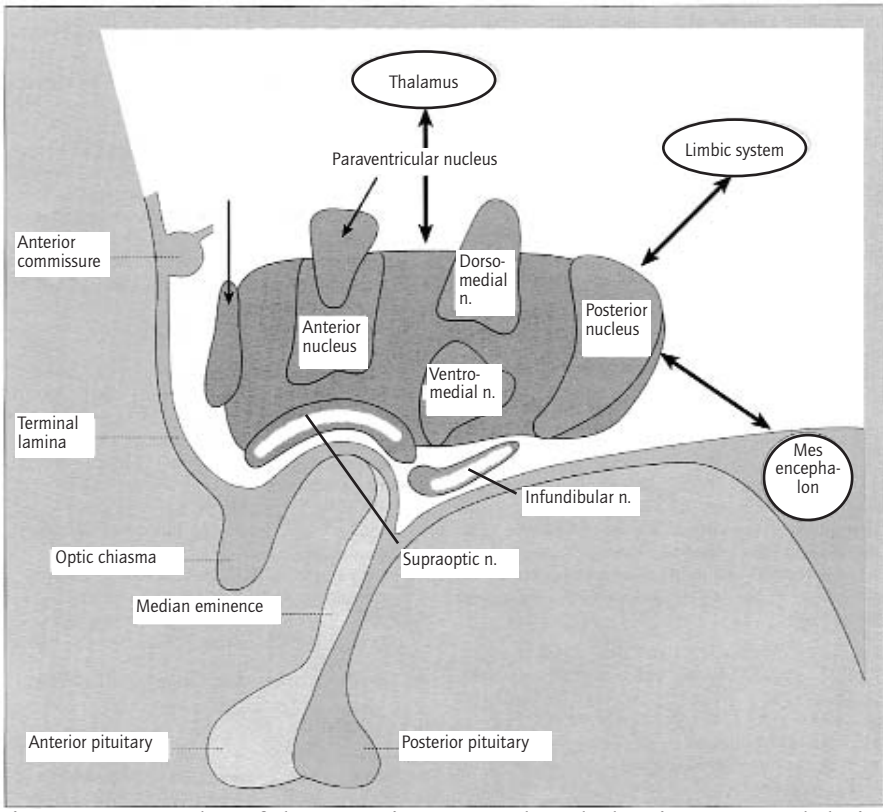


Fig.2: Topography of the most important hypthalamic areas and their relation to other brain areas

Control of GnHR pulse generator (9)

GnRH pulse generator is influenced by different systems or substances :

- Steroids (estrogen, gestagen, androgen) are the most important modulators
- Corticotropin-releasing hormone (CRH) is the essential substance for dealing with stress, pain and mood. It is mainly formed in the paraventricular nucleus and inhibits GnRH pulse generator.
- Melatonin is produced from serotonin in the epiphysis and lowers GnHR pulse rate with the help of opioids.
- Endogenic opioids (inhibitory neurotransmitters e.g. b-endorphin) are mainly synthesised in the arcuate nucleus. The endogenic opioid-system (EOS) is linked to different areas of the hypothalamus but also to structures controlling hormonal secretion of the pituitary gland (e.g. supraoptic and paraventricular nuclei, amygdaloid bodies, median eminence). Synthesis of GnRH, oxytocin and prolactin are controlled by a opiodergic basic level.
- Dopamine is mainly synthesised in the tuberoinfundibular system. There are close links to GnRH secreting neurons in the arcuate nucleus and in median eminence. Dopamine inhibits GnRH secretion and stimulates the release of b-endorphin which in turn inhibits dopamine release. We assume that this is where fine-tuning of GnRH pulsation takes place.
- The a-adrenergic system (noradrenaline, serotonin) is linked to GnRH neurons, particularly in the area of locus coeruleus. The system is able to either inhibit or stimulate GnRH pulse generation.

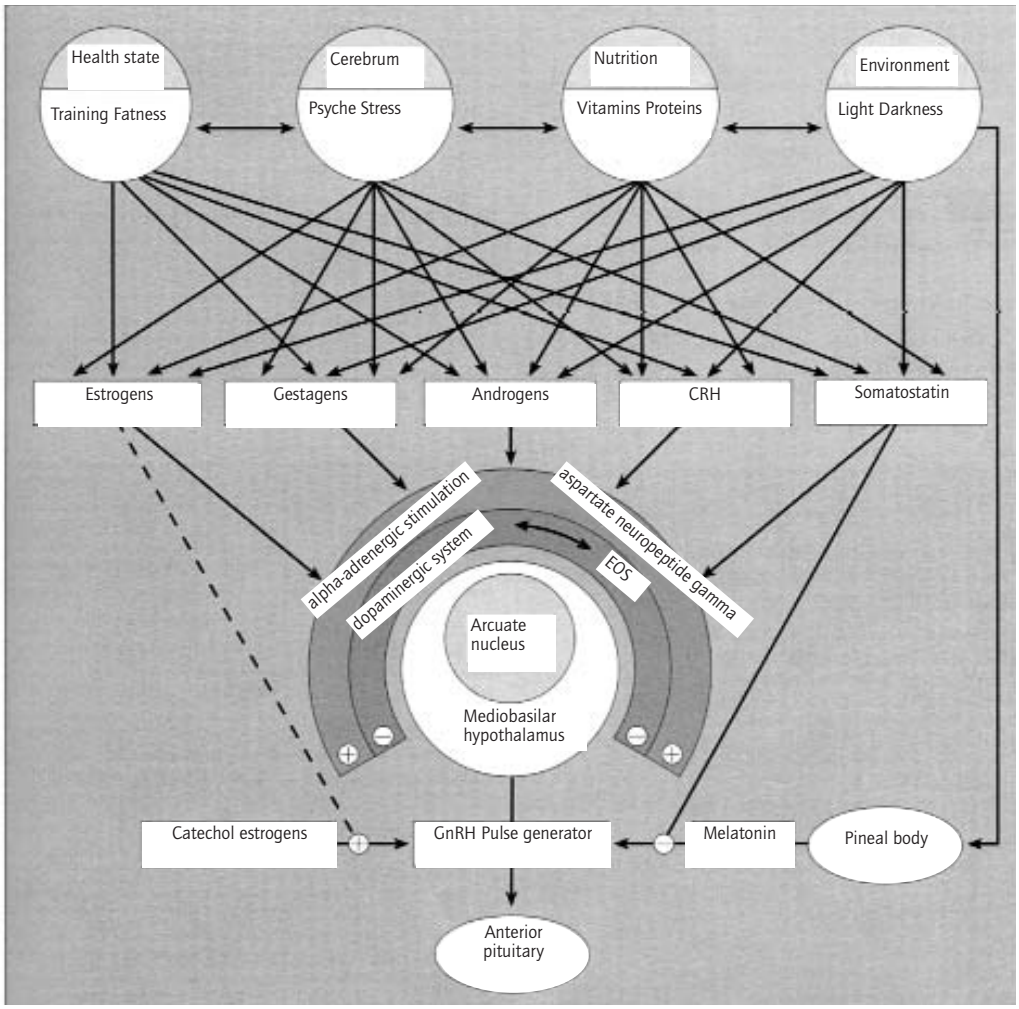


Fig 3:

Influences on central release of GnRH

GnRH receptors (9) :

Receptors are not only located in sympathetic ganglia but also in mast cells, ovary and placenta. The effect of the hormones is determined by the density of the receptors.

Release and regulation of gonadotropin (9):

There are three different types of feedback cycles for the release of gonadotropin: an ultra-short feedback cycle (=GnRH regulates its release itself), a short feedback cycle (=gonadotropins regulate their release themselves) and a long feedback cycle (=estrogens and progesterone regulate hypothalamic and hypophysial levels themselves).

The following are modulators for the release of gonadotropin:

- In high concentration estrogens stimulate and in low concentrations they inhibit (particularly FSH).
- Together with estrogen progesterone has a synergistic effect.
- Androgens inhibit LH- and FSH-release.
- CRH inhibits.
- Growth hormone and GH-RH stimulate.
- Inhibin prevents release of FSH.
- EOS, renin, ACE (angiotensin converting enzyme), angiotensin II, and growth factors all play their part in fine modulation.

1.4 Osteopathic reflections on physiology

There are two central longitudinal body axes which are anatomically close to GnRH-pulse generator or the pituitary gland:

1. One anatomical axis beginning at the coccygeal bone or terminal filament, going along the spinal canal, through the fourth ventricle, along the floor of the third ventricle to the terminal lamina. We view this axis as a functional axis of the central nervous system. Stuart Korth (66) and his team use techniques along this axis in order to trigger the so-called ignition which, as I understand it, means activating the link between the individual and the world around him / her or else between the individual and a higher, divine being, according to everybody's individual conception of the world.

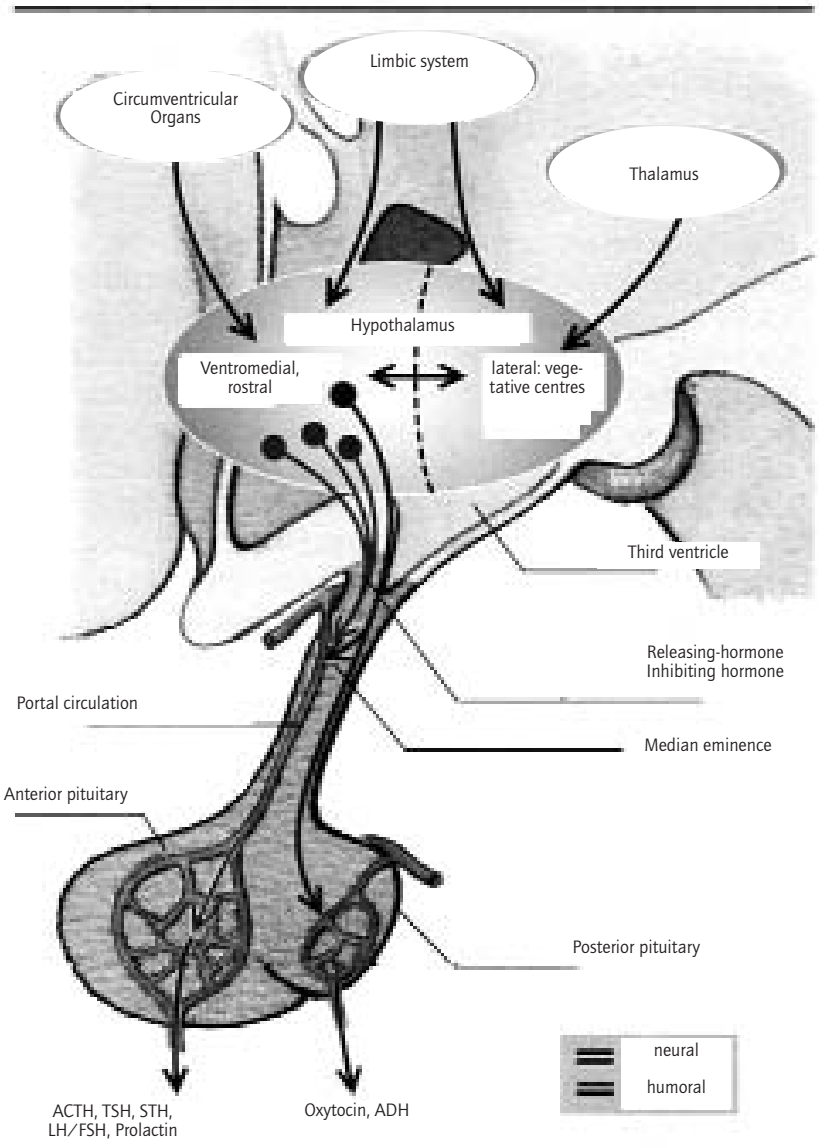
2. The other axis, the so-called notocordal axis, begins at the coccygeal bone as well and runs through the remains of chorda dorsalis, vertebral pulp, dens axis and ends in the body of the sphenoid bone, the osseous structure that encases the pituitary gland. The notochordal axis corresponds to an electromagnetic axis around which the human organism evolved and arranged itself.

It is quite conceivable that by harmonising the organism along these axes we might exert a harmonising influence on all the neighbouring structures of the central nervous system.

I mainly use a technique by which I begin exploration at the coccygeal bone and at either the occipital bone (for the notocordal axis) or the glabella (for the functional axis of the central nervous system). I try to palpate the momentary expression of the involuntary mechanism [8] and try to establish a link between the two end points of the axis by getting the different levels (bones, fasciae, fluids, ...) into a state as relaxed as possible. I wait for a change in the expression of the involuntary mechanism. Ideally, I achieve a slowing of the rate and an increase of amplitude of the wave-like motion (Stuart Korth and his team, 66).

Fig. 4:
Hypothalamo-hypophysial System

Hormones of the hypophysiotropic hypothalamus are secreted at the median eminence and transported to the adenohypophysis via hypophysial system of portal vessels. Hypothalamic neurons end at the neurohypophysis were they secrete ADH and Ocytocin into the bloodstream (at the median eminence ADH is also released into the system of portal vessels) Links of the hypothalamus to ohter parts of the CNS are marked with arrows.



Possible effects of this change are:

- A harmonisation in the area of infundibular nucleus and lamina terminalis probably has an influence on GnRH pulse generator.
- Locus coeruleus lies at the end point of the functional axis of the central nervous system in the lamina terminalis. A harmonisation of this area also influences the a-adrenergic system.
- Body of the sphenoid bone as the end point of the notochordal axis is one of the key positions of the pituitary gland. Dysfunctions in the area of the sella turcica (osseus in the area of the body of the sphenoid bone or fascial in the area of the sellar diaphragm) are possible disturbing factors for hypophysial function and function of the hypophysial stalk. A change of this dysfunction should also change function in the tuberoinfundibular system or the hypophysis itself.

In this way both GnRH pulse generator and its fine regulation may be influenced.

A very important effect of these techniques is the general relaxation and harmonisation of the entire body. Again and again I find it extremely helpful to first balance patients with prolonged and / or chronic stress patterns in this way before I begin with other therapeutic measures. Stress causes an increased release of CRH in the hypothalamus. By means of the anterior lobe of the pituitary gland (ACTH = adrenocorticotropic hormone) secretion of catecholamine in the adrenal medulla is stimulated. ACTH inhibits release of gonadotropin. Body defences are weakened by a prolonged elevation of cortisol levels. With this starting situation physiological stress of the transition of perimenopause becomes more difficult to compensate.

Many osteopathic techniques take contact at the ventricular system of the central nervous system. The idea behind these techniques is to influence fluctuation of the cerebrospinal fluid on the one hand, and to bring about changes in metabolic procedures of the neighbouring areas of the central nervous system on the other hand. These changes are brought about indirectly by changes in the cerebrospinal fluid: whether they occur by modification of flow or pressure, by changes in the makeup of the fluid or by other factors remains unknown. The EOS (with all its links) in particular seems to be very susceptible to techniques influencing the cerebrospinal fluid.

One thing that seems particularly interesting to me in this context is that circumventricular organs lie outside the blood-brain barrier and therefore are susceptible to many different peripheral influences. I am quite sure that by applying osteopathic techniques to the peripheral zones of fine modulation for the release of gonadotropin (e.g. in the area of the kidneys and the adrenal gland or in the area of uterus and ovaries) we can take an influence, by means of the humoral flow. Very likely the areas of these organs benefit from a better arterial blood supply and a better venous and lymphatic drainage which definitely improves their function.

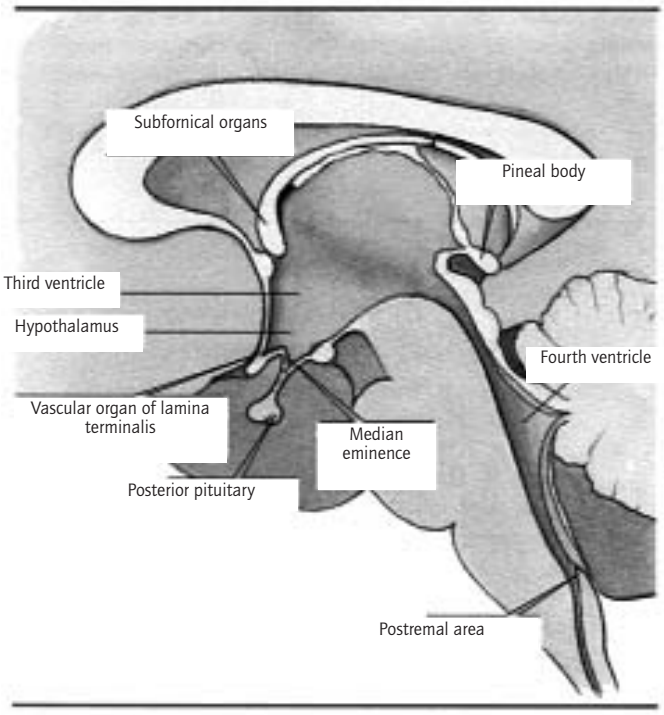
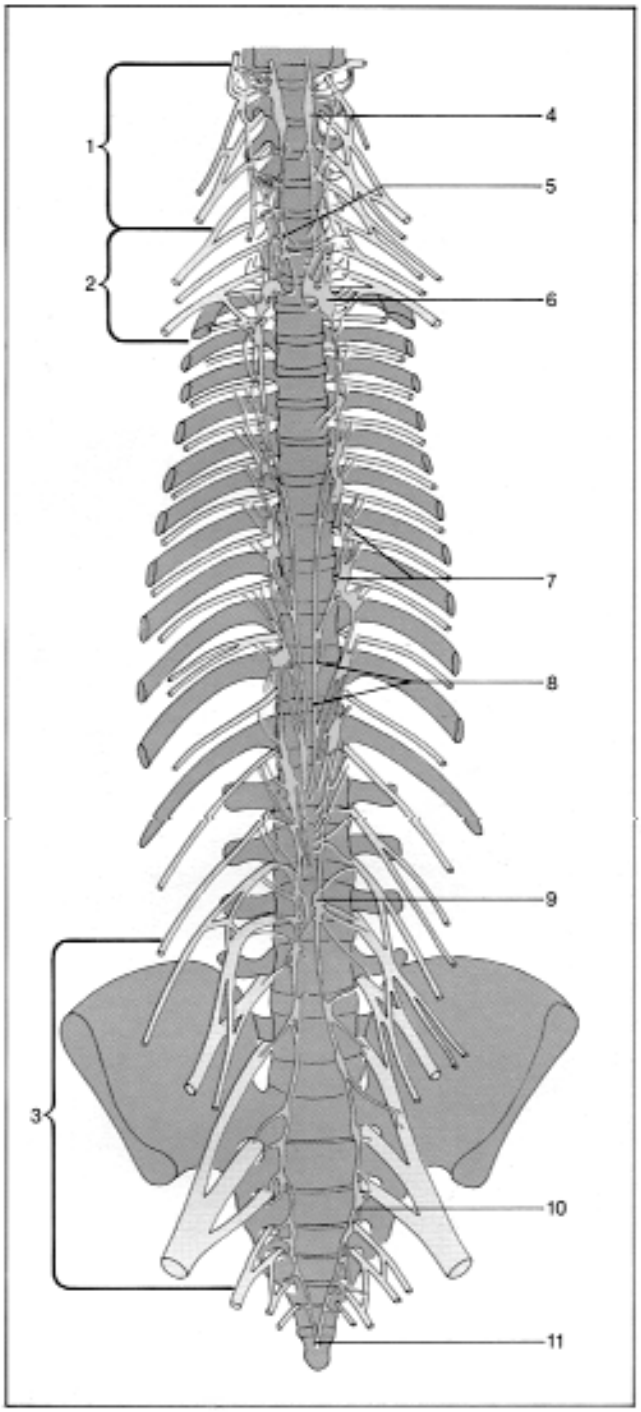


Fig. 5: Topography of circumventricular organs: Circumventriclar organs lie outside the blood-brain barrier so that e.g. peptide hormones can fulfil their function as humoral afferent.

Another possibility of applying osteopathic techniques is via the autonomic nervous system.

Some of the typical complaints of perimenopause such as hot flashes, heart palpitations, anxiety or nervousness can also be attributed to a hyperstimulation of the sympathetic tone. Hot flashes in particular are seen as a hyperreaction of the sympathetic tone occurring following a lower endogenic opioidal tone with a special stimulation of the thermal centre and simultaneous LH-release. It seems to be possible to have a balancing effect on the sympathetic tone. Basically, there are two strategies to reduce sympathetic tone: inhibition of the sympathetic nervous system or stimulation of the parasympathetic nervous system. It depends on the individual which method is more promising. All those osteopathic techniques are suitable which inhibit cervical ganglia, ganglia or sympathetic trunk ganglia in the area of the solar plexus. Stimulation of the parasympathetic nervous system is best done with techniques working along the vagus nerve (e.g. in the area of the cranial base, cranial articulations, cervical fasciae etc.) and techniques in the area of sacral parts of the parasympathetic nervous system (spinal segments S1 – 4 at the height of the thoracolumbar junction, lumbar spine and sacrum).

Overstimulation of sympathetic ganglia can be caused by dysfunctioning anatomical structures which are either situated close to the sympathetic trunk ganglia (e.g. capitular articulation) or else which trigger the whole functional segment of the spine by reflex action. If osteopathic techniques can reduce this type of disturbances, the sympathetic tone can be harmonised as well.



Truncus sympathicus (nach *Pick* u. *Sheehan* 1946)

Fig. 6

1. Cervical plexus
2. Brachial plexus
3. Lumbosacral plexus
4. Superior cervical ganglion
5. Medium cervical ganglion
6. Cervicothoracic ganglion (stellate ganglion)
7. Thoracic ganglion
8. Major thoracic splanchnic nerve
9. Lumbar ganglion
10. Sacral ganglion
11. Unpaired ganglion

1.5 Ageing processes of the endocrine system

(8, 10, 32)

Hypothalamus:

It is assumed that any ageing process is set off by a basic change of the biological clock or an increasing disorganisation of neurotransmitter secretion. Suprachiasmatic nuclei are known to be pacemakers for the circadian rhythms.

Hypophysis:

Even before observing cycle irregularities we find that growth hormone levels (GH) and levels of insulin-like growth factor-1 (IGF-1) have decreased. The impact of this alteration is not completly understoodbu, but it is assumed that there is a link to the sensitivity of the pituitary gland towards GnRH.

THS (thyroid stimulating hormone) and prolactin levels remain the same but triiodothyronine (T3) concentrations decrease. Pulsatile THS and prolactin release are suspected to remain the same but that negative feedback on the hypothalamus-hypophysis-axis weakens.

As soon as changes in menstrual cycles occur, FSH increases, inhibin decreases and estradiol levels usually remain the same. LH begins to increase slightly. Increase of gonadotropins occurs because hypophysis is stimulated to release higher amounts by a lower follicular production of inhibin and a higher sensitivity of the hypophysis to GnRH. Rate and metabolism remain the same.

Ovary:

In perimenopause the remaining number of primordial follicles have a greater influence on the cycle than the age of the woman. Estradiol peaks without subsequent ovulation or corpus luteum formation lead to irregular bleeding. Sensitivity to FSH in the ovary is reduced which requires a higher FSH level in order to set off folliculogenesis; a fact which makes estrogen levels rise. Typically, FSH and estrogen levels are elevated and progesterone lowered.

As menopause sets in the remaining number of primordial follicles is negligible. Estrogen levels go down dramatically in the first year of menopause. The remaining estrogen is exclusively synthesised from androstenedione with a small part of it being aromatised in the postmenopausal ovary. Glucocorticoid suppression or an adrenalectomy reduce estrogen levels to almost zero.

Androgen secretion is lowered but the postmenopausal ovary keeps secreting androgen (in particular androstenedione and testosterone).

The ovary is an important endocrine organ even after menopause. It is still susceptible to gonadotropin and can build steroids.

Adrenal gland:

In menopause the level of circulating androstenedione is kept up almost entirely (80%) by the adrenal gland after production in the ovaries has declined. With ageing androstenedione secretion in the adrenal gland diminishes as well, although this might occur independently of menopause.

Production of DHEA (dehydroepiandrosterone) and DHEAS (DHEA sulfated form) decreases, glucocorticoid secretion remains unchanged or even increases. The typical 24-hour pattern of cortisol secretion changes (the early-morning peak disappears). The daily rhythm aldosterone ampli-

tude decreases but it remains unclear whether it is related to hot flashes or sleep disturbances.

Endometrium:

Perimenopause is the age with the highest incidence of curettage or hysterectomy usually performed because of prolonged menstrual bleeding. It is unclear why bleeding problems occur more often at that age but hormonal changes and other, as yet unknown, age-related local changes may be responsible for them.

The endometrium becomes atrophic in menopause and sensitivity to estrogen stimulation seems to disappear.

Adipose tissue:

There is a link between BMI (body mass index) and estrogen levels since androgens are aromatised in adipose tissue.

1.6 Osteopathic reflections on ageing processes of the endocrine system

Processes of ageing are part of our physiology. They cannot be and are not meant to be prevented by osteopathic treatment.

It seems to make sense, however, to apply osteopathic treatment to the endocrine system in age-related changes. Each additional dysfunction acquired in the course of life presents an additional strain on an organ or a system which is being exposed to a higher physiological stress caused by changes.

In my opinion one of the most important measures is to reduce the raised stress level or to change pathological stress patterns towards physiology. A very efficient approach is to use techniques which influence the involuntary mechanism (see: osteopathic reflections on physiology).

In the area of hypothalamus and pituitary gland it seems to make sense to improve arterial blood supply and venous and cerebro-spinal fluid drainage in order to create a basis for the best possible metabolic situation in this area.

Suitable techniques in the area of the hypothalamus are those which are applied to the ventricular system or the dural system of the cranium. The area of the hypophysis and the hypophysial stalk are best treated with techniques which relax the sellar diaphragm, intraosseus techniques for the sphenoid bone or techniques for the sphenobasilar suture. Better drainage of the cranium can be obtained by improving arterial blood supply in the area of the cervical spine and cranial base and venous and lymphatic drainage particularly in the area of the cranial base. In this context drainage of the venous sinuses seems to me to be essential. Technical possibilities are manifold and should be chosen according to the individual patient's findings.

By means of these techniques it should be possible to have a harmonising influence on the areas of neurotransmitter secretion (e.g. EOS, tuberoinfundibular system, a-adrenergic system).

In context with the physiological fluctuations of hormone levels it would make sense to optimise mechanisms of excretion and detoxication of the body. In midlife years these functions are often impaired by unfavourable habits, environmental conditions, medication, vaccination, past diseases, increased and / or persistent stress, etc. .... Dysfunctions in the area of the liver, lungs, bowels, kidneys or excurrent urinary passages have to be treated osteopathically in order to ensure a smooth functioning in the transitional phase.

Dysfunctions in the lower abdomen are frequent even with young women. The causes are manifold: scars following surgery or inflammations or problems having to do with pregnancy and childbirth, just to mention a few. Adhesions in the lower abdomen are directly linked to a premature onset of menopause (7). In my opinion it is an essential part of osteopathic treatment to use techniques which help to make scars elastic and permeable. Another "must" is to ensure smoothness of abdominal and pelvic fasciae.
Prolonged bleeding in perimenopause may be the result of hormonal fluctuations but they may be attributed to a dysfunction in the area of the lower abdominal organs or rather their system of suspension. In my experience this type of bleeding can be alleviated spontaneously or even stopped altogether by applying osteopathic techniques, such as visceral techniques. In my experience techniques which balance tension of abdominal walls and those which harmonise the fascial suspension system of lower abdominal organs prove very satisfactory.
Considering the fact that the ovary remains an important endocrine organ even in older age osteopathic treatment should also be applied in order to reduce possible dysfunctions in that area. In this way we can prevent insufficient arterial blood supply or venous and / or lymphatic obstruction in this area.

Another important aspect is function of the pelvic diaphragm. Incontinence and chronic infections of the urogenital tract are extremely common complaints of menopause and perimenopause. Complaints often start very early on (sometimes even before perimenopause) and are still often accepted as a normal sign of ageing or are concealed for a false sense of shame. A transition as sensitive as perimenopause is a good opportunity to start talking about these things and to treat them, if necessary. There are plenty of osteopathic treatment strategies: we can reduce local dysfunctions, dysfunctions in the abdominal organs, stress patterns, we can improve posture, relaxation mechanisms, we can optimise excretion and detoxification mechanisms, we can stimulate immune defences, etc. ...

Starting from midlife years we often find changes in the posture with subtle changes of the spinal curvatures which gradually lead to chronic dysfunctions particularly in the junction areas. Chronically strained areas such as cervical and lumbar spine are a typical sign of chronic dysfunction. All this is the result of "collected" traumata of a lifetime as well as a compensation of all sorts of external and internal influences a woman has been exposed to. Two areas of posture-related dysfunction in context with perimenopausal complaints are worth being looked into.

Very often we diagnose a sharp kyphotic curve combined with a extended posture of the cervical spine. This posture changes the pattern of the visceral parts of the neck, in particular cervical fasciae where the thyroid gland is embedded. It seems plausible enough that the flux in the vessels from and to the thyroid gland is disturbed, thus leading to a functional change of the thyroid gland. Functional disturbances of the thyroid gland may mimic perimenopausal complaints. Osteopathic treatment should ensure a relaxed surrounding for the thyroid gland.
The thoracolumbar area and the diaphragm are regions where dysfunction often occurs and we find significant changes in the dynamic of the diaphragm. If we consider the movements of the diaphragm to be a kind of "driving force" for the abdominal organs, it seems natural to treat dysfunctions in this area, particularly since the adrenal glands are situated so close to the diaphragm. By treating this area we can exert a positive influence on hormonal secretion of the adrenal glands.

There are different possibilities of approaching the problems osteopathically. As a matter of principle, however, the aim of any osteopathic treatment should be to reduce pathological stress, both globally and locally, as well as optimise functions. It depends on the individual patient's findings which therapeutic approach and way to choose.

1.7 Overview of Literature

Women have always judged the transitional time of perimenopause and postmenopause very differently and they still do (11, 12). Depending on their cultural background and their social surroundings they either see it as a natural phenomenon or as a disease (13, 14).
In western industrialised countries hormone replacement therapy has become a profitable business (11). Menopause has come to be seen as a kind of life-threatening disease (15, 16): without hormone replacement therapy (HRT) there's an increased risk of osteoporosis, chronic cardiovascular diseases, Alzheimer's and so on. The last few years only have brought a change of paradigm (17, 18, 19).
Studies have shown that only a certain percentage of women suffer from symptoms worth treating (20). Whether women do have complaints or not depends on a number of factors: physical or emotional stress, smoking, alcohol, hereditary diseases, lack of exercise, social surroundings, cultural view of ageing to mention just a few (21, 22). Of course there may be pre-existing illnesses which have, for a longer period of time, put a strain on certain organs.
With today's knowledge, quite a number of the studies on HRT have to be taken with a grain of salt. Many studies have argued the potential bias of the "healthy-user effect" (23, 24) or the fact that participants of the study did not represent an average population but a special group of patients (21, 25).
There are controversial statements as to the side-effects of HRT. Many doctors believe that the risk (3, 9, 26, 27) of getting thrombosis or a stroke increases considerably, if there are pre-existing, chronic cardiovascular diseases. The statements concerning the risk of cancer (31), such as breast cancer (34, 35, 36) are just as controversial. The effects of HRT on the central nervous system particularly as far as morbus Alzheimer's is concerned are not clear at all (36, 37).
Unfortunately there is still very little scientifically proven knowledge about alternative possibilities. Dietary recommendations (38, 39), phytopharmaca (40, 41, 42, 43), physical exercise (44), psychotherapy (45, 30) and stress management (46) seem to have a certain effect. Some of these alternatives, such as the use of phytoestrogens, however, are subject to doubt as regards their effects and their side-effects (38, 47, 48).
The most promising concepts seem to be those which have an individual and holistic approach (17, 20, 49).

In recent years only, and very gradually, perimenopause and menopause have again been looked upon as a natural process or a maturation crisis. On the other hand there is a distinct desire in our society to stay young as long as possible. Youth is equivalent to performance and (sexual) attraction. Ageing is negatively marked. Gain in social prestige for ageing women is practically non-existent in our society.
In this ambivalent situation, which brings along very real changes, a woman needs a lot of strength to pursue a satisfying and rewarding way of life.
We know about a number of factors which can influence a woman's life in a negative or a positive way, but there are very few approaches to meet the individuality of each woman concerned.

Osteopathy is a means of tending to a woman individually and to enable the organism to react better to the physiological changes in this time of life.
Due to the low number of participants this pilot study is only meant to show a trend and point to questions arising in the future. I do hope, however, that this study gives an impulse to others to conduct studies on osteopathic treatment in perimenopause or other phases of transition.

1.8 Research issue and hypotheses

My initial thought was the following:
"If a woman, suffering from menopausal complaints, undergoes osteopathic treatment individually chosen for her particular situation, complaints will be reduced".
The following are the hypotheses:

1. Complaints do not improve significantly.

The observation which led me to the research issue was accidental or the improvement was not related to the osteopathic treatment the patient received.

2. The complaints improve significantly both in the treatment group and in the control group.

The period of observation is rather short in relation to a phase which lasts several years. Even without therapeutic treatment health state and health perception are subject to changes because of significant fluctuations in the hormone levels, among other things (7, 50). Many women report that they feel better and generally more at ease after a menstruation period. There are quite a number of confounding variables which may influence the problems in a negative or positive way (21).

3. Problems improve significantly in the treatment group because the osteopathic treatment primarily improves quality of life and thereby indirectly reduces complaints.

Compensatory capacity of the body is increased by osteopathic treatment. Changes are more easily adapted to (Still AT: The Philosophy and Mechanical Principles of Osteopathy. Osteopathic Enterprise, Kirksville 1986. Definition of the Word "Treat" p. 69 – 71).

4. Complaints improve significantly because osteopathic treatment, apart from improving compensatory capacity of the body, directly influences those mechanisms which set off the complaints.

The waning function of the ovaries is not the only reason for perimenopause. Another reason is a desynchronization of neurohormonal and neuroendocrine signals (10). Specific osteopathic techniques influence the central nervous system. One of the, by now, classical osteopathic techniques is the compression of the fourth ventricle [1]. Dr. W.G. Sutherland assumed that by this technique he could influence hormone release in the central nervous system (Sutherland WG: Contributions of Thought. Collected Writings. The Sutherland Cranial Teaching Foundation 1967; p. 151 and 152). In the area of the ventricle walls and the cerebral aquaeduct there are zones of high concentration of endorphins. Neurons in this area are in direct contact with the thalamus and the hypothalamus, the optic chiasma and the epiphysis. There is speculation that cerebrospinal fluid influences the neuro-immuno-endocrine system (Liem T: Kraniosakrale Osteopathie. Hippo-krates Verlag Stuttgart 1998; p. 214).

2. Methodology

2.1 Sample Survey

Participants:

The study concentrated on women who were suffering from menopausal complaints and who had grown up in Central or Western Europe. Their menopausal complaints were determined according to the menopause rating scale, MRS II.(51)

Referral:

In July and August 2000 general practitioners and gynaecologists in the vicinity of my office in Vienna were sent information about this study. Health facilities in Vienna which treat women with menopausal complaints from a holistic, that is a not uniquely traditional point of view, were informed as well. The letter contained all relevant information about aim of the study, criteria for inclusion or exclusion as well as the request to refer women concerned to my office or pass the information on to those who were interested in the study (see appendix). Medical staff of the group practice my office belongs to were informed personally. Response was low, so in September and October I placed an advertisement in a Viennese weekly paper.

Number and description of participants:

There were 13 women who enrolled in the study. They were either patients of the practice group or they came because of the advertisement. All thirteen women had to undergo a waiting period during which they were part of the control group. Afterwards they were referred to the study group.

Their age, at the time of the study, ranged between 44 and 53. Six of these 13 women were living in a marriage or a marriage-like partnership, five of them did not have any children, eight of these women had a total of 14 children.

Five women had A-levels, Five had a university or a polytechnic degree which corresponds to a higher than average level of education. I suppose that women with a good education are more likely to be interested in new, alternative ways of therapy or else that information about osteopathy has found its way to higher levels of education only. Treatment as part of the study was free of charge which was one reason why I had expected women from lower-income classes or lower education classes to be interested in the study.

At the time of the study none of the participants was suffering from a major illness. Four women were on regular medication for hypertension. One woman each was taking circulatory medicine, enzymes for digestion or pain killers, if needed. Three women were using herbal or pollen remedies against menopausal complaints. Two women were being treated homoeopathically.

None of the women received HRT or other therapies. Most of them were only prepared to undergo HRT if “absolutely necessary for medical reasons”.

Recruitment:

All the women who had come in answer of the advertisement or because their doctor had referred them to me were personally informed about the course of study, and critically checked on the criteria of inclusion or exclusion (questionnaire about criteria of inclusion or exclusion, see appendix).

Inclusion criteria :

At the beginning of the study the severity of the complaints had to be defined. On the scale of MRS II they had to score at least a total of five which corresponds to the category of "few complaints" (51).

It was essential that all the women had grown up in Central or Western Europe. On the one hand menopause is not just a biological change: Canadian scientist Margaret Lock defines menopause as a "biocultural event" (13). Comparative intercultural studies show different menopausal complaints and a different way of evaluating them (13, 14). On the other hand measuring instruments which are developed in one cultural environment need not necessarily be valid in a different cultural environment (52).

Participants must have had at least one menstrual bleeding in the preceding 12 months. This is the definition for perimenopause or menopause if done retrospectively (6).

Exclusion criteria :

Surgical / artificially induced menopause: Women whose menstruation period has ceased because of surgery, chemotherapy or radiation therapy do not live a normal transition.

Postmenopause: women in post-menopause have already concluded their transitional phase.

Oncologic diseases: in the context of this study I wanted to examine healthy women or women with minor health problems. In the course of my professional activities I often noticed that I could not manage to stimulate the organism in a positive way, at least not within a short period of time, if the women had previously experienced a serious illness or some type of cancer. The planned number of osteopathic treatments in the course of the study would most probably not have been sufficient to document significant changes.

Systemic diseases: (metabolism, musculoskeletal system, nervous system, organs, auto-immune diseases, ...): they cannot be taken into consideration for the same reasons as oncologic diseases can't. Interaction with other therapies may occur and there are diseases such as e.g. thyroid problems which may set off the same typical symptoms as perimenopause (53, 54).

Therapies using hormones or hormone-like substances: hormonal remedies (including contraceptives) or hormone-like substances such as Tamoxifen, alter symptoms. (Annotation: it proved to be extremely difficult to find women interested in the study who did not take hormone replacement or the contraceptive pill).

Therapy with corticosteroids: sex hormones are steroid hormones and interaction with corticosteroids may occur (55).

Psychoactive drugs may alter menopausal complaints (56).

Homeopathic therapy or phytopharmaca: a homeopathic therapy or a therapy with herbal supplements for menopausal complaints were a criterion for exclusion, if therapy was started within the six

weeks prior to T0 (1st testing), if it was changed within these six weeks or if it was changed during the study.
Originally I planned to include only women with no other therapy or medication. Unfortunately, response was so low that I would not have been able to find enough patients for my study within the planned time frame. I suppose that women who are interested in osteopathy are at the same time interested in other alternative methods as well. The participating women were either not on medication, as a matter of principle, or else they had been taking herbal or homeopathic remedies for a longer period of time.
Having talked to some of the doctors and health care providers who had referred patients to me I decided to settle on "no change in medication during the six weeks preceding the study". In this way I could exclude major changes caused by these remedies.
Organic menopausal symptom complex: complaints such as osteoporosis or cardiovascular diseases are not typical for menopause since they are usually long-term consequences of the hormonal change. If they do occur during menopause they are indicative of an underlying disturbance pattern.
Depression: Women suffering or having suffered from depression tend to have more problems with menopause (57, 58, 59).

Declaration of consent:
Each potential participant received a declaration of consent during her first testing. Participation in the study was only possible after signing the declaration.

Drop-out rate:
Between mid-August 2000 and mid-December 2000 I was in touch with approximately 70 women, either personally or by phone. After sorting out criteria for inclusion or exclusion 21 women received the questionnaire. Two women did not answer. Three women were not taken up into the study because their complaints were not serious enough. Having evaluated the questionnaires I included 16 women in the study. Two women could not continue because their gynaecologists advised them to have HRT in order to treat excessive bleeding. One woman had to undergo gynaecological surgery during the study.

2.2 Course of examination

Prospective pilot study:
This thesis is a prospective pilot study. Unfortunately, due to a tight schedule, it was not possible to include a higher number of cases both in the control group and the treatment group.

Groups:

Every woman who got in touch with me was personally checked for criteria of inclusion or exclusion. Those who met the required criteria were asked to fill in a questionnaire concerning their general health, quality of life and menopausal complaints. They were given a statistical data sheet and a declaration of consent.

I checked the completed questionnaires once more and established the total score for MRS II.

All the women having a total of five or more were informed by phone that they were enrolled in the study and both appointments for the therapy sessions were fixed for approximately six and nine weeks after the initial testing. All the women who had their appointments were included in the control group for the first six weeks and after that in the treatment group.

Variables:

I used two variables:

1. Health-related quality of life which was measured according to the questionnaire for the general state of health SF-36, a self-evaluation sheet covering a recall period of 4 weeks (60).
2. Type and intensity of complaints measured with the help of MRS II (menopause-rating scale) (51) a self-evaluation sheet as well.

Both parameters are equally valid (51).

Examination protocol:

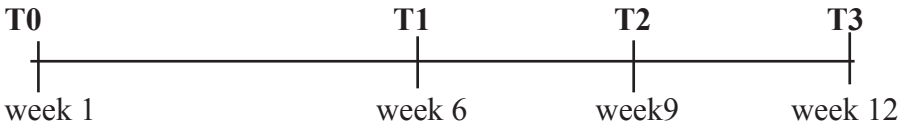
Each participant was part of a control group which was monitored for six weeks: Immediately afterwards they were referred to the treatment group for another six weeks. At the beginning of the control group (time T0) all the women completed the questionnaire with questions regarding their health, a statistical data sheet and the SF-36 and the MRS II. This set of questionnaires was sent to the participants or given them personally.

After six weeks, at the end of the control group (time T 1), the women again answered SF-36 and MRS II. This time the questionnaire was completed in my office. The end of the control group was at the same time the beginning of the treatment group (time T1). All the women received their first treatment session on the day of the second testing.

Approximately three weeks later they had their second treatment (time T2).

Three weeks after the second treatment the women were sent SF-36 and MRS II for answering (time T3).

Schedule:



Data:

I once established socio-demographic data (statistical data sheet) and general data concerning health state. I three times established general health-related data on the quality of life and type and intensity of menopausal complaints.

	Measuring of:	*Therapy:*	*Length / Place:*
TO	MRS II SF-36 Socio-demographic and general health data		Sent or given personally
T1	MRS II SF-36	Osteopathic case history, testing and treatment	Surgery 90 Min.
T2		Osteopathic treatment	Surgery 45 Min.
T3	MRS II SF-36		sent

Protocol of the course of therapy:

First appointment:

The first treatment took place about six weeks after the first measuring. Treatment took place in my surgery, always in the same room.

Participants were given 15 min. to complete the questionnaire for the second measuring.

After that I established an osteopathic case history, osteopathic findings and I performed osteopathic treatment. All this took about 75 min per patient.

The case history was established with the help of a case history sheet which I use for all the adult patients, male or female, coming to my office (see appendix).

Then I did a routine of the following global tests:

1. Observation of the woman standing as regards symmetrical deviation from anterior, posterior and lateral as well as assessment of postural type.
2. General listening of fasciae (2) in standing position.
3. Evaluation of the spinal curve with the aid of active motion of the spine in standing position (3).
4. Forward bend test (4) standing.

5. Forward bend test [4] sitting.
6. Screening of the spine [5] in sitting position.
7. General listening of abdominal fasciae [6] in supine position
8. Palpation of the lower abdominal organs in supine position with assessment of tissue density.
9. Assessment of craniosacral system [7] and involuntary mechanism [8] .
10. Taking of blood pressure at both upper arms [9] .

According to case history, symptoms and results of the global tests I carried out specific osteopathic tests. For some of the patients I needed additional results (laboratory parameters, x-rays, dental status). Patients were asked to bring along the required data for the second treatment.
After that I carried out osteopathic treatment individually devised for each patient. There were two aspects I paid particular attention to with all the participants. First the structures and functions linked to the hormonal axis (running along hypothalamus, pituitary gland, thyroid gland, adrenal glands, ovaries and uterus) and second I tried to balance the patients along their notochordal axis (midline) [10] and stimulate their involuntary mechanism [8] .

Second appointment:
I arranged for the patients to come about three weeks after their first treatment and they received their second treatment in the same rooms as the first time. Each patient was treated for 45 min.
At the beginning of the session each women was asked about her health-state and her reactions to the first treatment. Then I established the clinical picture for that particular day according to the pattern of the first treatment.
Treatment again was done according to the individual person. Hormonal axis and midline were again my main focus.
At the end of the treatment the patients were reminded that they would be sent the third set of the questionnaire in about three weeks time.

Overview of the osteopathic results:

Comparison of the case histories of all the participants revealed the following similarities:

- 12 out of 13 women reported having experienced episodes of severe problems of joints or soft tissue either within the preceding three years or currently.
- 11 out of 13 patients talked of current problems in their digestive tract (bloating, diarrhoea, constipation).
- 10 out of 13 patients reported functional problems of the liver and gall bladder (such as fat intolerance, alcohol intolerance, raised liver readings)
- 10 out of 13 patients complained of menstruation problems.
- 10 out of 13 said they had been living in a very stressful situation either personally or professionally for at least three years and nine out of these 10 said they felt worn out.
- Eight out of 13 complained of problems with their teeth or jaws.

- Eight out of 13 had chronic infections or functional problems of their urinary bladder.
- Eight out of 13 described having undergone at least one traumatising shock.
- More than half of the women had suffered a severe trauma of the spine or the skull, and more than half had, at some time in their past, suffered a severe neurological disturbance such as meningitis, trigeminal neuralgia, concussion accompanied by unconsciousness, fits of cramps, loss or partial loss of peripheral nerve function).
- Out of 14 live births eight had been high risk or problematic deliveries.

Evaluating the osteopathic anamneses I was surprised to find an accumulation of problems and past diseases. I was not so sure anymore whether I had really found the target group of "healthy women". Although the participating women considered themselves to be healthy by and large, they were due to their history and their other complaints (independent of perimenopause ?) a group with many stimuli that cause stress, in particular for metabolism and musculoskeletal system.
Osteopathic findings confirmed the anamneses.

Evaluation of all the osteopathic tests revealed the following frequent prioritary osteopathic dysfunctions [11] :

- All the patients suffered from chronic dysfunctions of the spine in the junction areas of C0 / C1 / C2, C7 / T1 and L4 / L5 / S1. Half of the patients had dysfunctions of the coccygeal bone and / or the lumbar spine.
- Two thirds of the patients suffered from dysfunctions in the area of the thoracic diaphragm and the thoracolumbar area which was almost always linked to obstructive symptoms in the lower abdomen.
- Dysfunctions of the liver, liver capsule or the suspension system of liver and gall bladder were just as frequent.
- More than two thirds of the patients had dysfunctions in their urogenital tract that is the suspension system of uterus, urinary bladder, ovaries and / or suffered from dysfunctions of their abdominal wall fascia or the perineum. Tissue quality of the of the lower abdominal organs was strikingly "excited" or "upset" (either from the beginning of the treatment or later when obstruction in the lower abdomen began to subside).
- 12 out of 13 women had dysfunctions in their craniosacral system [7], half of these problems consisting of fixations as experienced after a whip-lash trauma [12], half of them had compression patterns [13] of the sphenobasilar suture and / or dysfunctions in the area of the facial skull.
- Reaction of the tissue to therapeutic intervention varied more heavily than was known to me judging from younger or older women. Almost all the women were subject to strong mood swings. Palpable tissue quality, tissue reactivity, relaxation capacity during treatment and mood were very much subject to changes. Looking back at all these phenomena I can say that sudden change and fickleness is the one feature which was common to all the participants.

During therapy sessions in my function as operator I came across a problem I had not expected. At times I felt under pressure, both of time and performance, in order to be as therapeutically efficient

as possible within the time frame and design of the study. In some cases I would have needed considerably more time for things such as balancing midline in a satisfactory way or the interval to the next session was not right.

Advising patients on how they can themselves contribute in a positive way to their well-being, an aspect which is usually very important for me, was not considered sufficiently for two reasons: time was too short and I wanted to prevent further confounding variables from distorting the results during observation period. Giving thorough advice on habits of life (nutrition, exercise, luxury food, addictive drugs, relaxation strategies, ...) is important and makes sense. Detoxicating and metabolically relieving measures for the individual patient have proved to be effective for those patients of mine which can be compared to the ones of my study.

2.3 Measuring tools

Variable general quality of life in relation to health: (60):

In recent years defining health has undergone a change of paradigm. Psychological and social aspects of life and the effects of long-term changes caused by diseases are being given more attention. Classical target criteria of traditional medicine such as reduction of symptoms and longevity are being assessed more critically as regards quality of life.

Health-related quality of life (also called subjective health) is defined via subjective health indicators. There are at least four parameters which are commonly used: mental health, physical health, social competence and functional competence.

Measuring tool SF-36: (60)

The Short Form (SF) Health Survey questionnaire is the shortened version of an measuring tool which was developed as part of the Medical Outcomes Study (MOS) in the United States.

The questionnaire contains 36 items concentrating on areas such as physical functioning, physical role function, physical pain, general health perception, vitality, social competence, mental health and health changes.

The individual questions are asked using either a binary system (yes – no answers) or an up to six point scale which patients mark with a cross. A self-evaluation sheet covering a recall period of four weeks was handed out and patients were given 7 – 15 min. to complete these sheets (see appendix for complete questionnaire).

Variable menopausal complaints:

Symptoms described in context with menopause are not data of general validity. As a matter of fact, they are a means of communication between women talking about their problems. Therefore, complaints typical of menopause have to be seen in the context of their cultural background. Their significance varies from woman to woman and from background to background (61).

The more negative feelings a woman develops towards menopause in general or to her particular situation the more symptoms will develop (17).

For the time being symptoms are divided into three groups of chief complaints (62): vasomotor, somatic and psychological symptoms.
In the 1950s there were the first attempts at evaluating menopausal symptoms (63, 64). Research in the following decades brought new results which criticised the Kuppermann- Index, the first internationally recognised measuring instrument, and symptoms of menopause were defined in a different way. The only true symptoms of menopause were considered to be hot flashes and genital atrophy. In the early 1990s a German-Austrian-Swiss group of experts began to develop a new scale which did not only evaluate symptoms due to lack of estrogen (such as hot flashes and genital atrophy) but also psychosomatic symptoms of menopause.

Measuring tool MRS II: (51)
The Menopause-Rating-Scale II was methodically standardised in the German population.
MRS II is a self-evaluation sheet. It contains 11 items with pre-formulated multiple choice answers (5) which are marked with a cross.
Three categories of menopausal complaints are evaluated:

1. physical-autonomic (hot flashes, sweating, heart palpitations, sleep disorders, achy joints and muscle problems)
2. psychological (depressive moods, irritability, anxiety, physical and mental exhaustion)
3. urogenital (libido, urinary tract, vaginal dryness)

(For the complete questionnaire see appendix)

I decided to use subjective measuring tools, i.e. a self-evaluating measuring instrument, because women's symptoms are only measurable in a subjective way. For the time being, useful objective measuring parameters are not available. Determining the hormone level in the blood is only a "snapshot" since hormone levels vary greatly in perimenopause. Moreover, conclusions on the well-being of women cannot be drawn from the hormone level.

Osteopathic treatment in itself is subjective which means it depends on the subjective findings of the osteopath and they are individually designed for each patient. Osteopathic treatment is meant to influence the individual person as a whole. It is not exclusively symptom-oriented. Health-related quality of life seems to me a suitable criterion to indicate alterations in a person as a whole.

Finding a questionnaire for climacteric complaints proved to be difficult since, in general, hardly any validated German language material is available and the international trend goes to objective measuring instruments for menopausal complaints. An additional problem is the fact that very often only problems due to lack of estrogen are seen as menopausal complaints. This view seems to me to be overly simplified and does not really do justice to the complex phenomena of this transition. MRS II, in my opinion, offers two distinct advantages: it has been standardised in the German population and the items cover the different categories of complaints well, also in view of an osteopathic approach to treatment. Alterations in the sympathetic tone are documented in the physical-autonomic items. Harmonisation of the central nervous control mechanisms (e.g. changes of

the endogenous opioid tone) can be seen in the psychological items and reduced dysfunction in the area of the lower abdomen should be reflected in the urogenital items.

One technical problem of measuring, however, was that both treatment and measuring had to be done in standardised intervals but some women took longer than others to react to the therapy. Besides, it is not unusual that patients first experience intensified symptoms since the organism may react to the osteopathic treatment either with familiar patterns such as pain or latent symptoms may come to the surface. At least one of the patients became worse within the surveyed period. Her reaction to the treatment was very slow and so, in retrospect, the second treatment should have taken place at a longer interval to the first one.
In my opinion this question of time / intervals cannot be avoided, however it can be minimised by surveying a greater number of patients which unfortunately was not possible within this study.

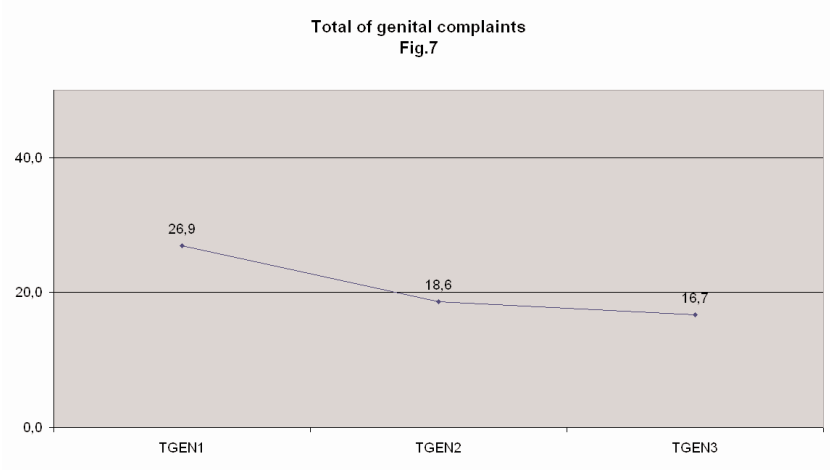
3. Results

The questionnaires of all 13 participants could be evaluated (n = 13). Data was - according to instructions - partially converted (SF-36: a higher score indicating a better quality of life ; MRS II: a lower score indicating fewer complaints) and afterwards re-calibrated (SF-36). According to instructions missing data was put through statistical techniques. Afterwards all data was transformed to a scale of 0 - 100 percentage points [points] and an arithmetic mean was established.

Results of MRS II:

"Genital complaints" (questions 12h, 12i, 12j: sexuality, urinary tract, vaginal dryness):

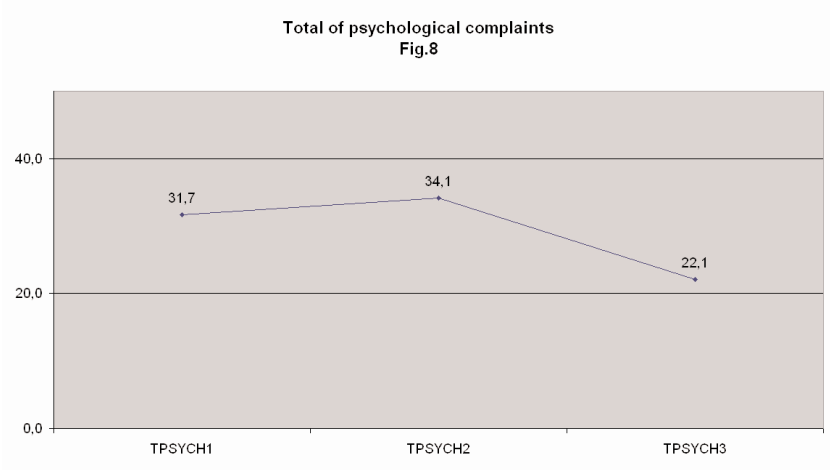
	N (valid)	N (missing)	median scores
T0 (TGEN1)	13	0	29,6
T1 (TGEN2)	13	0	18,6
T3 (TGEN3)	13	0	16,7



Genital complaints lessened during control period from an initial score of 26.9 at first measuring to 18.6 at second measuring (-11 points). During treatment period genital complaints lessened minimally from 18.6 (second measuring) to 16.7 (at third measuring, -1.9 points). (Figure 7)

"Psychological complaints" (questions 12d, 12e, 12f, 12g : depressive moods, irritability, anxiety, physical and mental exhaustion):

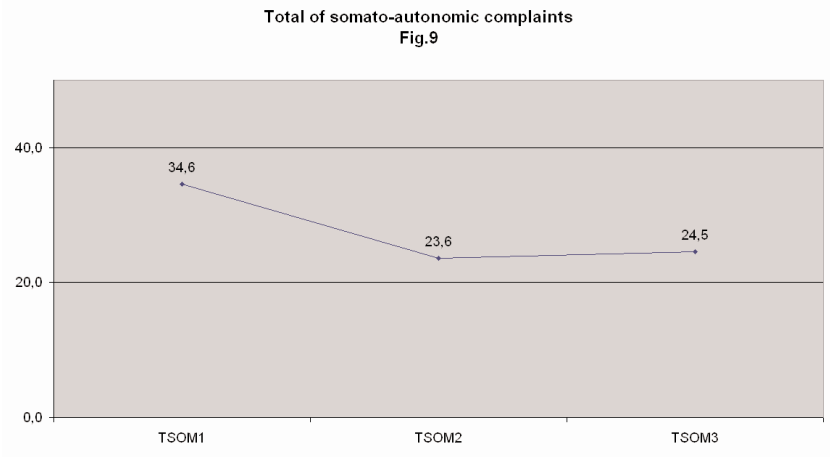
	N (valid)	N (missing)	median score
T0 (TPSYCH1)	13	0	31,7
T1 (TPSYCH2)	13	0	34,1
T3 (TPSYCH3)	13	0	22,1



Psychological complaints increased slightly during control period from initially 31.7 (first measuring) to 34.1 (second measuring +2.4 points). During treatment period psychological problems decreased from 34.1 (second measuring) to 22.1 (third measuring, -12 points). (Figure 8)

"Somato-autonomic complaints" (questions 12a, 12b, 12c, 12k: hot flashes, heart palpitations, sleep disturbances, achy joints and muscles):

	N (valid)	N (missing)	median score
T0 (TSOM1)	13	0	34,6
T1 (TSOM2)	13	0	23,6
T3 (TSOM3)	13	0	24,5

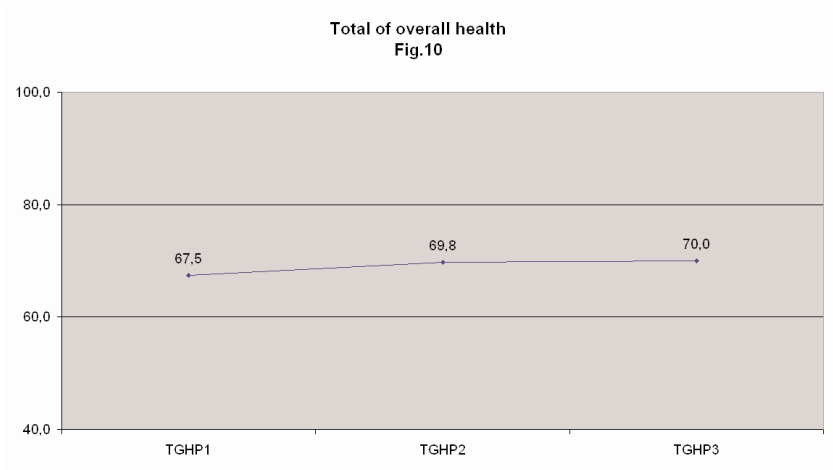


Somato-autonomic complaints decreased during control period from initially 34.6 (First measuring) to 23.6 (second measuring, -11 points). During treatment somato-autonomic complaints remained more or less the same: 23.6 (second measuring) and 24.5 (third measuring, +0.9 points). (Figure 9)

Results of SF-36:

General health perception (questions 1, 11a, 11b, 11c, 11d):

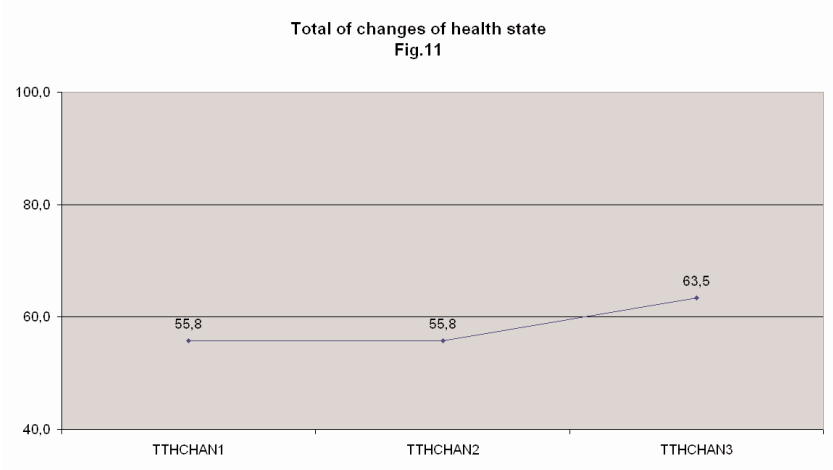
	N (valid)	N (missing)	median score
T0 (TGHP1)	13	0	67,5
T1 (TGHP2)	13	0	69,8
T3 (TGHP3)	13	0	70,0



General health during control period improved slightly from an initial score of 67.5 (First measuring) to 69.8 (second measuring, +2.3 points). General health during control period remained more or less the same: 69.8 (second measuring) and 70.0 (third measuring, +0.2 points). (Figure 10)

Change in overall health (question 2):

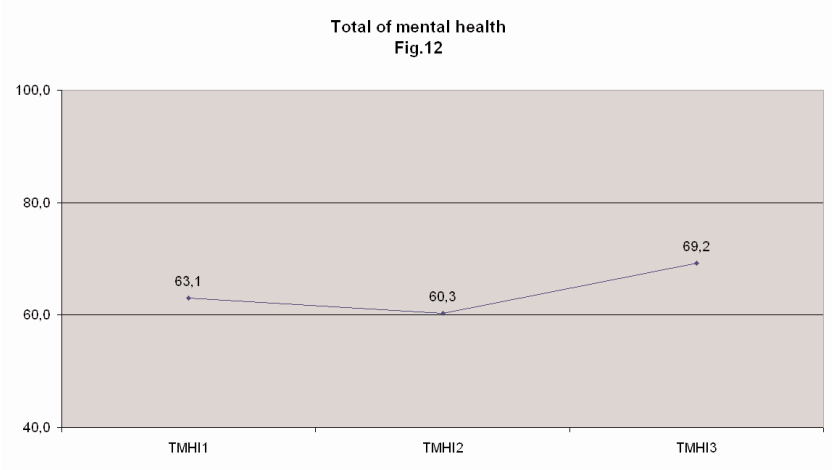
	N (valid)	N (missing)	median score
T0 (TTHCHAN1)	13	0	55,8
T1 (TTHCHAN2)	13	0	55,8
T3 (TTHCHAN3)	13	0	63,5



There were no changes of overall health during control period. During treatment period over-all health changed from 55.8 (second measuring) to 63.5 (third measuring, +7.7 points). (Figure 11)

Mental health (questions 9b, 9c, 9d, 9f, 9h):

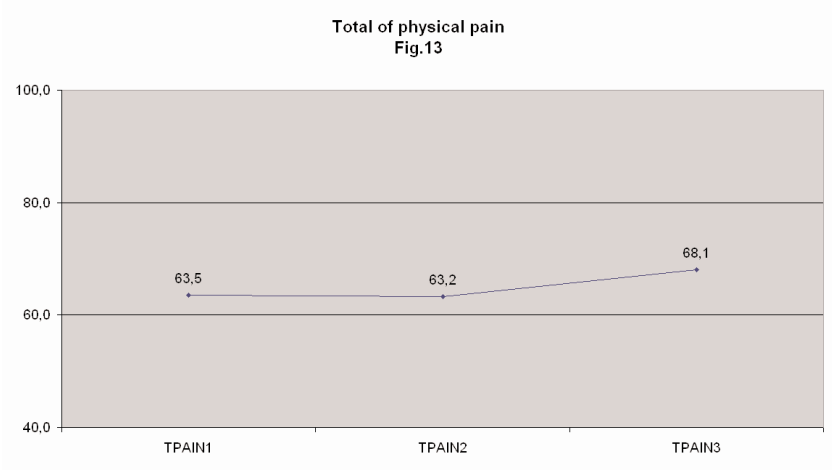
	N (valid)	N (missing)	median score
T0 (TMHI1)	13	0	63,1
T1 (TMHI2)	13	0	60,3
T3 (TMHI3)	13	0	69,2



Mental health during control period decreased slightly from 63.1 (first measuring) to 60.3 (second measuring, -2.8 points). Mental health during treatment period improved from 60.3 (second measuring) to 69.2 (third measuring, +8.9 points). (Figure 12)

Physical pain (questions 7, 8):

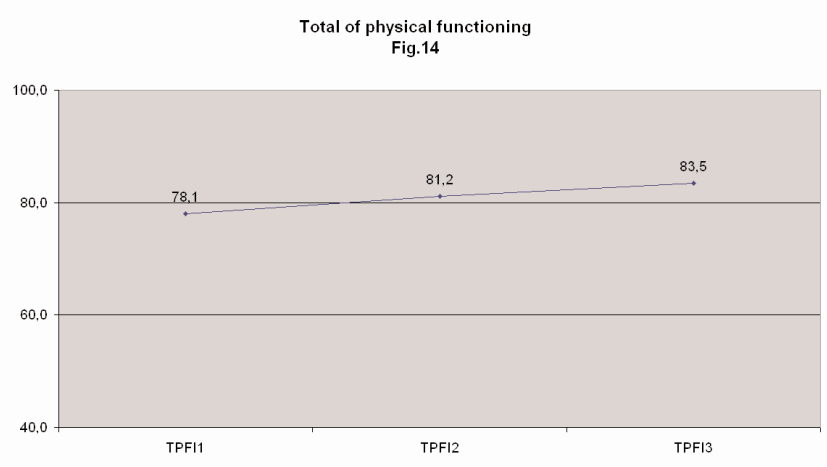
	N (valid)	N (missing)	median score
T0 (TPAIN1)	13	0	63,5
T1 (TPAIN2)	13	0	63,2
T3 (TPAIN3)	13	0	68,1



Physical pain remained more or less the same during control period: from 63.5 (first measuring) to 63.2 (second measuring, - 0.3 points). Physical pain during treatment period improved from 63.2 (second measuring) to 68.1 (third measuring, +4.9 points). (Figure 13)

Physical functioning (questions 3a, 3b, 3c, 3d, 3e, 3f, 3g, 3h, 3i, 3j):

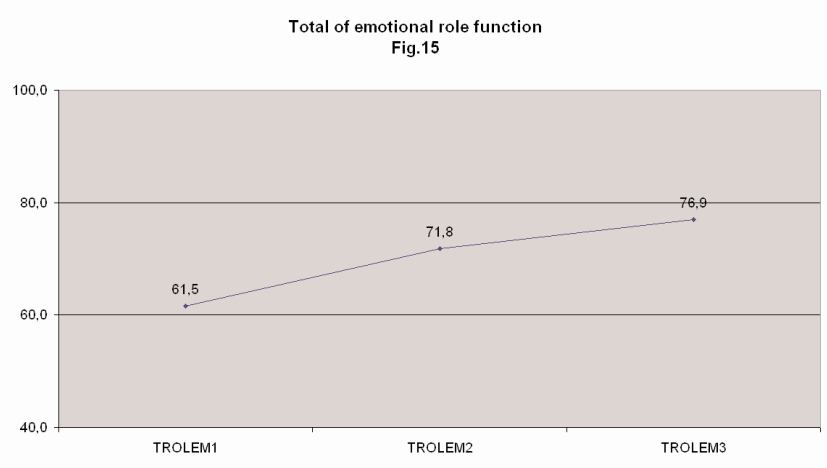
	N (valid)	N (missing)	median score
T0 (TPFI1)	13	0	78,1
T1 (TPFI2)	13	0	81,2
T3 (TPFI3)	13	0	83,5



Physical functioning during control period improved slightly from 78.1 (first measuring) to 81.2 (second measuring, +3.1 points). Physical functioning during treatment period also improved slightly 81.2 (second measuring) to 83.5 (third measuring, +2.3 points). (Figure 14)

Emotional role function (questions 5a, 5b, 5c):

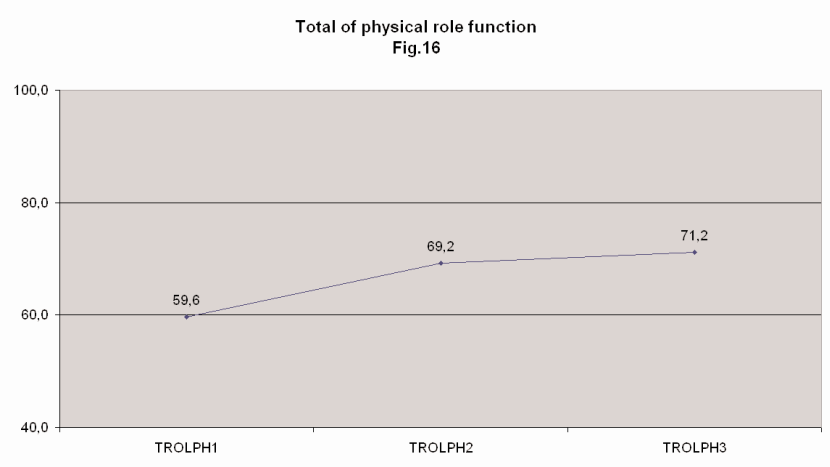
	N (valid)	N (missing)	median score
T0 (TROLEM1)	13	0	61,5
T1 (TROLEM2)	13	0	71,8
T3 (TROLEM3)	13	0	76,9s



Emotional role function during control period improved from 61.5 (first measuring) to 71.8 (second measuring, +10.3 points). Emotional role function during treatment period improved from 71.8 (second measuring) to 76.9 (third measuring, +5.1 points). (Figure 15)

Physical role function (questions 4a, 4b, 4c, 4d):

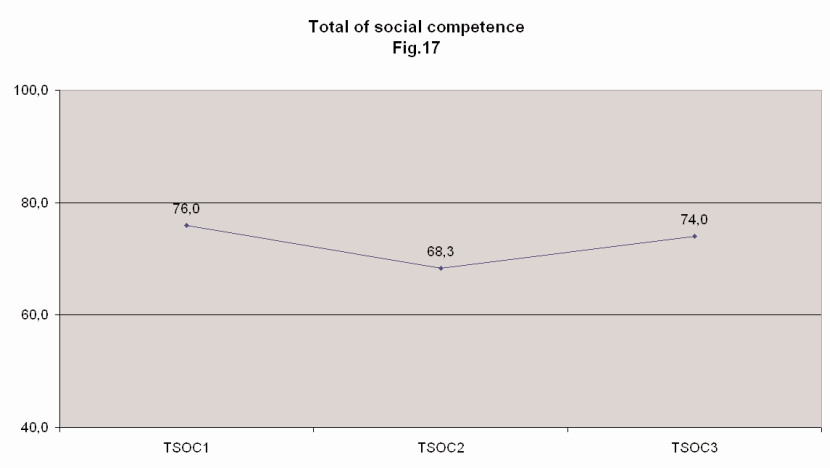
	N (valid)	N (missing)	median score
T0 (TROLPH1)	13	0	59,6
T1 (TROLPH2)	13	0	69,2
T3 (TROLPH3)	13	0	71,2



Physical role function during control period increased from 59.6 (first measuring) to 69.2 (second measuring, +9.6 points). Physical role function during treatment period improved very slightly from 69.2 (second measuring) to 71.2 (third measuring, +2 points). (Figure 16)

Social competence (questions 6, 10):

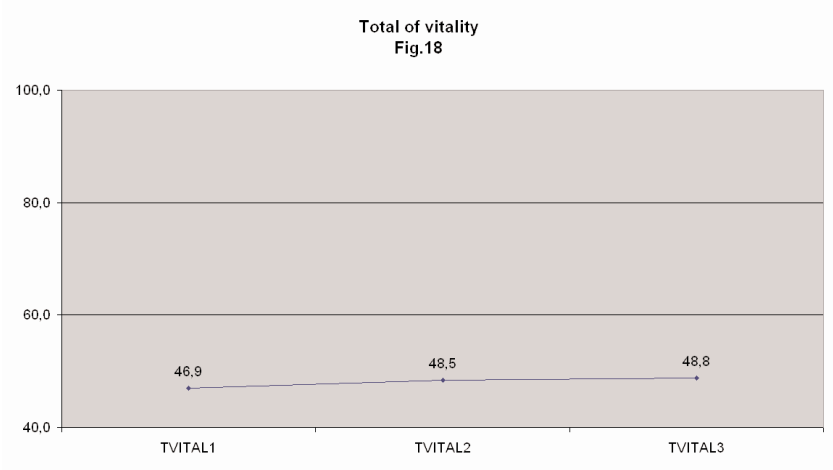
	N (valid)	N (missing)	median score
T0 (TSOC1)	13	0	76,0
T1 (TSOC2)	13	0	68,3
T3 (TSOC3)	13	0	74,0



Social competence got worse during control period from 76.0 (first measuring) to 68.3 (second measuring, -7.7 points). During treatment period, however, social competence improved from 68.3 (second measuring) to 74.0 (third measuring, +5.7 points). (Figure 17)

Vitality (questions 9a, 9e, 9g, 9i):

	N (valid)	N (missing)	median score
T0 (TVITAL1)	13	0	46,9
T1 (TVITAL2)	13	0	48,5
T3 (TVITAL3)	13	0	48,8



Vitality during control period and treatment period remained more or less the same: 46.9 (first measuring) 48.5 (second measuring, +1.6 points) or 48.5 (second measuring) and 48.8 (third measuring, +0.3 points). (Figure 18)

Summary of results

Evaluation of MRS II revealed that during control period genital and somato-autonomic troubles declined (–11 points respectively), psychological complaints, on the other hand, increased somewhat (+2.4 points). During treatment period psychological complaints decreased significantly (-12 points). Genital discomfort decreased slightly (-1.9 points), somato-autonomic complaints remained more or less the same (+0.9 points).

SF-36 showed that both during control period and treatment period overall health (a total of +2.5 points) and vitality (a total + 1.9 points) remained almost unchanged. Physical functioning (a total of +5.4 points), physical role function (a total of +11.6 points) and emotional role function (a total of 5.4 points) improved both during control period and treatment period.
There was no change of health state during control period. During treatment period health state improved (+7.7 points).
Physical pain remained almost the same during control period but improved during treatment period (+4.9 points).
Mental health (-2.8 points) and social competence (-7.7 points) became worse during control period. During treatment period mental health improved (+8.9) and so did social competence (+5.7 points).

4. Discussion

Judging from the results of this study there is no definite answer to the question whether osteopathic treatment helps lessen the typical complaints of perimenopause. There are several reasons for that:

- Sample size during control period and treatment period (each time n = 13) is too small for conclusive results. What we do detect is a trend.
- Due to sample size interpretation of arithmetic median scores is difficult since individual results which deviate significantly from the rest of the group may skew overall results.
  Annotation: among the 13 participants there was not a single woman whose data deviated so much that it had to be left out of the calculation of median scores. However, in the different areas there is a marked difference between the individual women and initial scores on the whole are widely strewn (see appendix for complete set of data).
- The results obtained during treatment reveal a more or less significant improvement of quality of life in certain areas and a decline of complaints (only exception : somato-autonomic complaints) but the results have to be seen in relative terms because during control period there were also improvements in certain areas, some of them being even more significant than during treatment (somato-autonomic and genital complaints, physical and emotional role function). On the other hand, contrary to treatment period, during control period there were also certain areas with a tendency to decline (mental health and complaints, social competence).

Summing up my findings I can say that there was a general trend to improvement during the whole period of the study and that there was <u>no</u> trend towards decline during treatment.

My working hypotheses of study were partially confirmed and partially not confirmed :

1. <u>"Complaints do not improve significantly":</u>
   The areas of somato-autonomic complaints (+0.9 points) and genital complaints (-1.9 points) of MRS II as well the areas of physical role function (+2.0 points) and physical functioning (+2.3 points), vitality (+0.3p) and overall health (+0.2 points) of SF-36 remain more or less unchanged during treatment period. In this area hypothesis was confirmed whereas it was disproved in all the other areas.

2. <u>"Complaints improve significantly both in the treatment group and in the control group":</u>
   There are areas where there is a clear improvement during treatment period: psychological complaints (-12 points) in MRS II, mental health (+8.9 points), lessening of physical

pain (+4.9 p), emotional role function (+5.1 points), social competence (+5.7 points) and changes of health state (+7.7 points) in SF-36.
During control period there is also a clear improvement in certain areas: somato-autonomic and genital complaints of MRS II (-11 points respectively) physical (+9.6 points) and emotional role function (+10.3 points) of SF-36.
The only area which, during both control period and treatment period, improved considerably was emotional role function.
I cannot say to what extent these changes during control period were influenced by positive expectations of the participants or other confounding variables. This, however, was not any of the questions this study focused on. *(Annotation: in the area of psychological complaints and mental health these expectations would probably have had a negative influence.)*

3. "Complaints improve significantly in the treatment group because osteopathic treatment primarily improves quality of life which in turn leads to a lessening of complaints".
   Improvement of quality of life in certain areas is more pronounced than decrease of menopausal complaints. One exception is the area of psychological complaints of MRS II (-12 points). In this area as well as in mental health of SF-36 (+8.9 points) the study reveals a significant improvement.

4. "Complaints improve significantly because, additionally to a general improvement of compensatory capacities, osteopathic treatment directly influences those mechanisms which set off complaints":
   In the area of somato-autonomic (+0.9 points) and genital complaints (-1.9 points) there were hardly any noticeable changes during treatment period but there was a significant improvement in the area of mental health (-12 points). During control period the trend was just the opposite.

Results seemed to me to be quite intriguing at the beginning because, apart from a trend towards improvement of quality of life and reduction of complaints, I could not detect any pattern during the whole period of survey. Comparison of direct feedback from participants during treatment supplied evidence of an individual pattern: all the participants showed improvement (although in different areas) in their health perception. To me these results reflect the individuality of the women as well as the individuality of their complaints in spite of perimenopause, the one common denominator for all of them. Osteopathic treatment, in my opinion, is clearly beneficial for women suffering from menopausal complaints. The pattern of how it takes effect seems to be different for each woman.

Overall health and vitality of the women improved minimally during the study, which is not surprising, since they were basically healthy women during study period.

Physical pain decreased significantly during treatment period. This is a typical effect of osteopathy as the body uses energy more economically and as improved compensatory capacity of any system of our body usually leads to a decline in pain. (Most of my adult patients consult me in order to have their pain relieved.)

On average severity level of the participants' complaints at the beginning of the study was relatively low : on average MRS II revealed minor complaints; SF-36 revealed median scores of over 60 points (out of one hundred). – Subsequently I could expect little change on average. The more intense and acute complaints are at the beginning of treatment the more spectacular the results become.
It is not unusual, with osteopathic treatment of minor complaints, to bring latent discomfort to the surface, so complaints may at first intensify or new symptoms (which are actually old ones) may arise. My interpretation of this phenomenon is that the body actively tries to fight pre-existing, chronic problems in order to find a more economic and therefore healthier way of dealing with them.
I am quite aware of the fact that in some cases study period was not sufficiently long to record the effect of the treatment in all its implications (which means that in some cases I probably happened to measure the decline only).
Particular attention has to be paid to the results of the areas of psychological complaints (MRS II) and mental health (SF-36). These two areas are the only ones to show a slight deterioration during control period and a substantial improvement during treatment period. Participating women on the whole were neither conspicuous nor unusual from a psychological point of view.
I cannot really explain why osteopathic treatment should be so effective in this particular field. It seems rather unusual to me that the reason should be positive expectations which in some cases might also be negative, or else that there should be some kind of placebo effect.
I suppose that the results in that particular area may be attributed to my personal style of working with patients. For 14 years I have been working in an surgery of my own (at the beginning as a freelance physical therapist) and I have always had more women patients than men. Many of these women were referred to me because they were so-called "difficult" patients; difficult in the sense that no satisfactory result of physical therapy could be obtained or no satisfactory therapeutic communication could be established. Very often these women had pronounced physical symptoms but there was a decisive psychological component to the clinical picture. I have always succeeded in reaching satisfactory therapeutic results with these patients. It seems that my way of working with patients is particularly effective in this area, whatever the reasons may be.

On top of the above mentioned facts I suspect that the following confounding variables which may in part be due to the small number of participants have an influence on the study:

- Some women reported feeling better as soon as there menstrual bleeding began, particularly if they had not had any menstrual bleeding for a longer period of time. In some cases, however, menstrual bleeding started shortly after osteopathic treat-

ment. It is quite conceivable that treatment triggered a menstrual bleeding. On the other hand there were treatment groups of women whose excessive bleeding was reduced or whose prolonged menstruation period shortened. Self-regulatory forces of the organism were clearly activated.

- Participants were not all surveyed at the same time; the study stretched over a period of seven months (end of August 2000 to mid-March 2001). We cannot quite exclude the idea that seasonal factors (such as weather, infectious diseases, lower exposure to daylight or change of season) influenced the outcome of the study. Yet, there were no delays or missed appointments due to seasonal illnesses such as influenza-like infections.
- Changes of social environment (family, partnership, job) and changes of habits (diet, sport, smoking, alcohol, ...) were not taken into consideration since it would have gone beyond the scope of statistical utilisation (due to the small sample size). Effects of these different aspects are more or less well documented (4, 17, 21, 29, 39, 44). I cannot judge to what extent they take their effect in a relatively short study period of three months.

Apart from the small sample size there were a few other aspects which seem to me problematic. Treatment was conducted by one single osteopath only and it is quite likely that my personal work style has in a way influenced the outcome. Therefore it would be useful to have sample sizes of more than 100 and several osteopaths who carry out the treatment (with such a number of participants it could not be done in any other way).

Looking back I think that study period was not ideal for three reasons:

- Fluctuations in health perception due to physiological reasons may have influenced results.
- Time of reaction of the individual patient to the treatment may in some cases not have been recorded completely. I think that this is a basic problem every time we want to measure reaction on osteopathic treatment. Times of reaction are individually very different, in the same way as osteopathic manipulations have to be individually designed for the patient and the time of treatment
- Study period was the same length for all the participants but it did not take place at the same time.

It would definitely be interesting to observe and treat women during the complete transitional time of perimenopause. Of course, the highest possible number of confounding variables, which may have an effect in the course of several years, would have to be taken into account (change of habits, change of social surroundings, illnesses, ...).

By observing all the participants at the same time and by observing control group and treatment group at the same time, results of the evaluation would become much more meaningful.

Owing to the small sample size it was not possible to establish a population median. One thing that jumped to the eye was the high level of education of the whole group of participants which may be one reason why they knew about osteopathy (only well-informed people know about this form of therapy) and another reason might be the choice of media used to advertise for this therapy. (I got in touch with health-care facilities which deal with alternative forms of medicine and put an advertisement in "Falter", an alternative Viennese weekly.)
Severity level of complaints was relatively low on average which does correspond to a population median (51); for evaluating the efficacy of osteopathic treatment, however, a study with patients with a high level of complaints would be much more meaningful. Unfortunately this aspect was not part of the study design. - I had to use a low level of complaints, otherwise I would not have been able to enrol a sufficient number of participants within the scheduled timeframe.

Summing up all the results we can say that during observation period there was a general trend towards improvement of health perception which, however, was very much individually marked.
During treatment period influence on quality of life seems to be more pronounced than on menopausal complaints. In certain individual areas substantial improvements were observed although the initial level of complaints was relatively low.
Therefore it seems that osteopathic treatment during perimenopause does improve quality of life. However, there is no evidence that osteopathic treatment takes a direct influence on menopausal complaints. The reasons for that are most probably the small sample size and the short study period. It would be interesting to repeat the study on a much larger scale and over a much longer period of time which would only be possible, of course, with a team of osteopaths.

The next logical step would be to find out if improvement could be obtained for women with severe menopausal complaints and what these improvements would consist of. In order to conduct a study which enrols participants with severe complaints, it would be necessary to co-operate intensively with the relevant health-care facilities. As far as I know, in traditional, orthodox medicine, women with a high level of complaints are usually recommended to undergo hormone replacement therapy (as long as there is no contraindication). Therefore it is rather difficult to find women with severe complaints who do not take hormone replacement therapy. As far as I could find out we are more likely in alternative medicine to encounter women with a low level of complaints or women who are not or were not satisfied with what traditional medicine could offer them.
It should therefore be possible to persuade traditional medical institutions to co-operate with osteopaths on a scientific basis in order to find out how efficient osteopathic treatment is for women with severe complaints. Those women I worked with or talked to seemed to be eager to find a therapeutic approach which takes their individuality into account and which is free of side-effects.
It seems particularly important to me not to neglect the individuality of each patient and her complaints. – In traditional medicine this aspect is definitely not given enough attention although

women would very much wish so. Self-rating scales seem to be a good measuring tool for that purpose.

Apart from the basic efficacy of osteopathic treatment, which was shown as a tendency only, it would be beneficial to find out more about the mechanisms of the efficacy in relation to perimenopause.

The question is whether there are particular areas where osteopathic manipulations are particularly beneficial (e.g. direct influence on hormonal release or on the central nervous control mechanisms such as e.g. GnHR pulse generator) or is it the general improvement of compensatory capacity of the whole body which brings about the positive changes in this transition? I suppose it is a combination of both. The measuring tools used in this study are not suitable for answering this question.

One thing that seems important for future studies is to approach the topic under the aspect of desynchronization of rhythms as a means of expressing decompensation (in the sense of loss of homeostasis) (65).

It might be interesting as well to compare the trend of this kind of transition to trends of other kinds of transition. What is the effect of osteopathic treatment on quality of life and typical complaints of, let's say, puberty or masculine climacteric / midlife crisis?

5. Summary

In comparison to the number of studies carried out on hormone replacement therapy little research has been done on alternative possibilities in context with perimenopausal complaints. It is very rare that one finds a holistic and individual approach to this transition. The question was asked whether it is possible to reduce typical complaints a certain part of the female population suffers from.
13 healthy women went through a period of observation and treatment, each lasting 6 weeks.
Three times, these women had to complete the questionnaire on health-related quality of life, SF-36 and the questionnaire on menopausal complaints MRS II (Menopause-Rating-Scale) by means of self-rating scales.
Arithmetic median scores were established and the changes between the first and the second measuring (control period) were evaluated as well as the changes between the second and the third measuring (treatment period).
During treatment period two osteopathic treatments were applied.
During the whole observation period I noted a marked trend towards improvement of quality of life and a reduction of menopausal complaints.
During treatment period there was a significant improvement for certain areas, although severity of complaints was relatively low at the beginning of the study.
From the results I can recognise an individual pattern of complaints and an individual pattern of reaction to the osteopathic treatment.
In order to confirm this trend the study would have to be repeated with a higher number of participants or it would have to be compared to similar studies.

6. Reflexions

I would not ask the same questions by now. In my every day experience with patients, I learned that - in contact with health during treatment - symptoms of perimenopause almost every time start getting better. I am convinced now, that during transition of perimenopause osteopathy is useful equipment for health care.
I noticed that often the valuation of symptoms changes within the women. They feel more comfortable within a (basically) physiological transition and they are more patient with themselves, which of course reduces sympathetic tone and is a good basis for finding new strategies to cope with changes. When they started developing new promising perspectives (of their life) they lost "interest" in symptoms. Symptoms seemed to get less important in their perception.

Within the last two years I developed a feeling for hot flashes during treatment: it is a sensation like a very hot, quivering wave coming up the body, starting outside the feet of the patient, not only within the body, but also around it. It feels like a burst of energy, which heats up the tissues but does not "burn" (remove) barriers/lesions within them and then very briskly stops and disappears.
Tissue reactions within perimenopausal women feel more individually differentiated by now but basically the same like five years ago which gives me confidence in my capability of sensing the tissues and their metabolic reactions.

Due to getting in contact with the biodynamic concept of Dr. J. Jealous my understanding and perception of midline changed and is constantly developing.
And also my understanding of osteopathy is. I find it more and more promising to develop my perceptional competencies within the field of embryological development of the human body. I had the great chance to become accepted within the team of the Osteopathic Centre for Children in Vienna (OZK Wien), which is the perfect framework to dig on.
I could broaden my "technical equipment" assessing the midline. If in contact with the health of a patient, the body of the patient will decide, which technique is appropriate for the moment.

Due to nearly five more years of experience I would change some parts of the methodology now:
Inclusion criteria: I found it more interesting to treat women with more or more intense symptoms because changes get more visible. Within the last years I treated also a lot of women under HRT and quite often they decided to quit medication and went on with osteopathy "on demand" or with a combination of osteopathy and homeopathy or traditional Chinese medicine or naturopathy.
<u>Exclusion criteria:</u>
Oncologic diseases and systemic diseases are no more exclusion criteria because I learned to get in contact with the health in very ill patients too.

Course of therapy:

Interval between first and second treatment should be individual. Not respecting the individual reaction (time) of the patient reduces the effect of treatment. 45 minutes for treatment (especially for the second one) is usually not necessary. Treatment process in my daily work normally is finished after 20-25 minutes (due to greater experience and therefore greater efficacy).
Geting in contact with the health of a patient, balancing the body in relation to the midline, etc. is no more a question of time like before. If I am in contact with my own health, which means e.g. becoming centred easily at the beginning of a treatment session and if I get enough rest and relaxation too, I normally find it easy to get in contact with the health of the patient, too.

Reflecting the discussion of the study, I noticed that my personal valuation of placebo effect changed quite a lot. I do not find it intriguing any more that a (big?) part of treatment results is due to placebo effect. I welcome this effect because it also means addressing the self-healing mechanisms of the patient.

7. Literature review 2005

In December 2005 I did a new literature review about perimenopause using the same sources like before.
I found no osteopathic studies about perimenopause and also no studies about efficacy and/or use of osteopathic treatment for women in menopause.
There exist some more articles about typical problems of perimenopause, also in osteopathic journals (67, 68, 69).
Concerning alternative therapies there are some systematic reviews of randomised clinical trials (RCTs) by now (70, 71, 72). In some articles and studies it is noticed, that many women are using alternative therapies (73).
Medical practice guidelines show much more differentiated strategies for treating (peri)menopausal symptoms (74, 75).

8. Appendix

8.1 Acknowledgements

I am grateful to the participants of my study. They gave me their time and shared a part of their life with me.
Without the comprehensive and diverse education at WSO I would not have been able to conduct the study for my thesis. I am thankful to the board of directors for their organisation and to the lecturers for the knowledge and experience they imparted to me but most of all for the chance of becoming acquainted with their personal approach to osteopathy.
I extend my thanks to my coach Hanneke Nusselein, D.O. for her critical appraisal of my work, to Mag. Robert Wittmann for his statistical work, to Elisabeth Vogt for her translation, to Frank Sklenar for the adaptation of the graphs and figures and to my friend Lisa for her invaluable help with the layout.
My work has been greatly facilitated by the participants of our “Monday-training-group”, a kind of round-table which accompanied us through our studies and which always gave us the opportunity to get rid of our frustration and stock up on new ideas.
More than anything else I am deeply indebted to my husband for patiently putting up with my moods when workload got too much.

Angelika Mückler, June 2001

8.2 Glossary for “non-osteopaths”

(terms are marked by superior numbers)

(1) Compression of the fourth ventricle
(2) General listening of fasciae
(3) Active mobility test of the spine
(4) Forward bend test
(5) Screening of the spine
(6) General listening of abdominal fasciae
(7) Craniosacral system
(8) Involuntary mechanism
(9) Measuring of blood pressure at upper arms
(10) Notochordal axis (Midline)
(11) Prioritary osteopathic dysfunction
(12) Whiplash trauma
(13) Compression pattern of sphenobasilar suture

(1) Compression of the fourth ventricle:

There are several versions of this technique. The underlying principle is a stimulation of the involuntary mechanism by trying to centralise the cerebrospinal fluid in the fourth ventricle. The therapist tries to find a neutral point the system can relax in, then waits to detect the modified wave of the involuntary mechanism(8).

(2) General listening of fasciae:

This test is being done with the patient standing upright. She is instructed to stand relaxed and put the weight evenly on both legs. The therapist stands behind her, completely relaxed, and puts her hand on the patients apex. You feel the tension of the fascial structure and try to decide if and where, in this pattern, there is a fixed point around which the body is organised at that moment. Then you ask the patient to close her eyes and you assess the organisational pattern of fasciae once more.
This test is an indication of the area of the body where the prioritary dysfunction (11) is located.

(3) Active testing of the spine:

All the women were tested when standing upright. They were asked to carry out the movements unstrained, without any effort and to stop if any kind of pain was involved. The instruction ran as follows: “1. Turn your head left and then right. 2. Bend your upper body to the left and then to the right. Let the palm of your hand glide down the outer side of the thigh. 3. Keep your heels firmly on the floor and move your left knee first and then your right knee forward; your pelvis will move along. 4. Stretch both arms towards the

ceiling and follow your hands with your eyes."
In combination with the forward bend test I assess the flexion of the spine.

(4) Forward bend test:

Patient standing upright: The patient was asked to bend slowly forward and downward beginning at the head and keep perfectly relaxed. The movement should not be continued if any pain occurred; knees should not be flexed. The therapist then palpates bilaterally just under the posterior superior iliac spine. The movement in the sacroiliac joint and the flexion of the spine serve as a parameter for observation.

Patient sitting: The patient is sitting on the therapy table, feet on the floor, legs slightly apart. She is asked to bend slowly forward and downward, as she has done in the upright position. As before, the posterior superior iliac spine and flexion of the spine are observed.

Evaluation:

A difference between the two sides in extensive forward bending of posterior superior iliac spine in the upright position, indicates a possible disturbance in the area of the lower extremities.

A difference between the two sides in extensive forward bending of posterior superior iliac spine in a sitting position indicates a possible disturbance in the area of the sacrum or just above the sacrum.

More differentiated evaluation is possible in combination with other tests or with quality of movement.

(5) Screening of the spine:

I carried out this passive, global mobility test of the spine with the patient sitting. On the one hand I tested the quality of movement and the quality of soft tissue regarding passive lateral flexion and translation and on the other hand I tested flexion and extension of the whole movement .

(6) General listening of abdominal fasciae:

The therapist places her palms on the abdomen of the supine patient and tries to palpate the fasciae of the abdominal wall in order to find out which area of the abdomen or abdominal contents fasciae are organised around. This point within the inherent movement points to a possible prioritary dysfunction [11] in the area of the abdominal organs.

(7) Craniosacral system:

The dura mater is firmly anchored to the base of the skull and the sacrum and thus forms a core link between the two structures where motion of the involuntary mechanism [8] can easily be detected.

(8) Involuntary mechanism:

Dr. W.G. Sutherland discovered this mechanism and called it Primary, Respiratory Mecha-

nism. The effect of this mechanism which can be palpated in any part of the body is caused by the inherent motion of brain and spinal cord, the fluctuation of the cerebrospinal fluid, the mobility of the cranial bones and the sacrum. The motion is compared to the rhythm of a tidal flow. Different frequencies can be described.

(9) Measuring of blood pressure at both upper arms:

A difference in pressure of more than 10 mm Hg scale between the two sides is an indication of which side the prioritary dysfunction[11] lies on. Typically, you find a dysfunction on that side where you measure the lower pressure.

(10) Notochordal axis (Midline):

I learnt how to apply the principle of the midline of the body during my post graduate studies of child osteopathy at the London Osteopathic Centre for Children (Stuart Korth and his team). From the time of conception the human body develops along an electromagnetic axis. The body develops and organises itself around this longitudinal axis. Deviations can be palpated and influenced therapeutically.

(11) Prioritary osteopathic dysfunction:

Bernard Ligner, D.O., director of WSO, uses this term for the osteopathic dysfunction which, at the time of diagnosis, has the greatest negative influence on the organism.

(12) Whiplash trauma:

Through the forces released in an whiplash trauma the involuntary mechanism[8] can be partially blocked. Normal motion between occiput and sacrum is not palpable anymore.

(13) Compression pattern of the sphenobasilar suture:

The involuntary mechanism normally causes a gear-like rhythmic motion at the suture. This motion disappears with a compression pattern.

8.3 Bibliography

(referred to by numbers)

1. Still AT: Osteopathy Research & Practice. Eastland Press Seattle 1992
2. Horrigan B: Jim Jealous, DO – Healing And The Natural World (Interview), Alternative Therapies 1997; 1: 68-76
3. Matthews KM: Myths and Realities of the Menopause. Psychosomatic Medicine 1992; 54: 1-9
4. McKinlay SM: The normal menopause transition: an overview. Maturitas 1996; 23; 137-145
5. Buddenberg C, Buddenberg-Fischer B: Psychosoziale Aspekte des Klimakteriums. Schweizer Rundschau Medizin (Praxis) 1995; 24: 718-721
6. Greendale GA: The menopause. The Lancet 1999; 353: 571-580
7. Houmard BS, Seifer DB: Predicting the Onset of Menopause. In: Menopause. Endocrinology and Management. Edited by: Seifer DB, Kennard EA. Humana Press 1999, Totowa, New Jersey
8. Santoro N: Endocrinology of the Climacteric. In: Menopause. Endocrinology and Management. Edited by: Seifer DB, Kennard EA. Humana Press 1999, Totowa, New Jersey
9. Feige A, Rempen A, Würfel W, Caffier H, Jawny J: Frauenheilkunde. Urban Schwarzenberg, München – Wien – Baltimore 1997
10. Wise PM: Neuroendocrine modulation of the „menopause“: insights into the aging brain. Invited review. American Physiological Society 1999; http://www.ajpendo.org; herunter geladen am 2000-01-05
11. Oudshoorn NEJ: Menopause, only for women? The social construcion of menopause as an exclusivly female condition. J Psychosom Obstet Gynecol 1997; 18: 137-144
12. Utian WH: Menopause – a modern perspective from a controversial history. Maturitas 1997; 26: 73-82
13. Lock M: Menopause: Lessons from Anthropology. Psychosomatic Medicine 1998; 60: 410 – 419
14. McMaster J, Pitts M, Poyah G: The Menopausal Experiences of Women in a Developing Country:“There is a Time for Everything: To Be a Teenager, a Mother and a Granny“.Women & Health 1997; 26/4: 1-13
15. Tang MX et al: Effect of oestrogen during menopause on risk and age at onset of Alzheimer´s disease. The Lancet 1996; 348/9025. http://www.thelancet.com; herunter geladen am 1999-11-20
16. Suarez P: Androgen replacement in menopausal women. http://www.obygyn.net; her unter geladen am 2000-01-05
17. Avis NE, McKinlay SM: A longitudinal analysis of women´s attitudes toward the menopause: results from the Massachusetts Women´s Health Study. Maturitas 1991; 13: 65-79
18. Dennerstein L, Dudley E, Guthrie J, Barret-Connor E: Life Satisfaction, Symptoms, and the Menopausal Transition. Medscape Women´s Health 2000; 5/4. http://womenshealth.medscape.com; herunter geladen am 2000-12-07
19. Dickson GL: A feminist poststructuralist analysis of the knowledge of menopause. Adv Nurs Sci 1990; 12/3:15-31
20. Sydow K, Reimer Ch: Psychosomatik der Menopause: Literaturüberblick 1988-1992.Psychother.Psychosom.med.Psychol. 1995; 45:225-236

21. Avis NE, Crawford SL, McKinlay SM: Psychosocial, Behavioral, and Health Factors Related to Menopause Symptomatology. Women´s Health 1997; 3: 103-120
22. Gannon L, Stevens J: Portraits of Menopause in the Mass Media. Women & Health 1998; 27: 1-15
23. Rödström K et al: Pre-existing risk factor profiles in users and non-users of hormone replacement therapy: prospective cohort study in Gothenburg, Sweden. BMJ 1999; 319: 890-893. http://www.bmj.com; herunter geladen am 2000-01-05
24. Matthews KA et al: Prior to Use of Estrogen Replacement Therapy, Are Users Healthier than Nonusers ? American Journal of Epidemiology 1996; 143/10: 971-978
25. O´Dea I, Hunter MS, Anjos S: Life satisfaction and health-related quality of life (SF-36) of middle-aged men and women. Climacteric 1999; 2: 131-140
26. Bakir S, Oparil S: Etrogen Replacement and Heart Disease. Clin Rev Spring 2000: 67-72. http://womenshealth.medscape.com; herunter geladen am 2000-12-07
27. Herrington DM et al: Effects of Estrogen Replacement on the Progression of Coronary-Artery Artherosclerosis. The New England Journal of Medicine 2000; 342/8: 522-529
28. Bailey J: Symposium Report: New Trends in Transdermal HRT and Aspects of Climacteric Psychology. European Menopause Journal Spring 1997. http://medscape.com; herunter geladen am 1999-11-11
29. Dennerstein L : Conference Report. 5th European Congress on Menopause. Medscape Women´s Health 2000; 5/4. http://womenshealth.medscape.com; herunter geladen am 2000-12-17
30. Grodstein F et al: A Prospective, Observational Study of Postmenopausal Hormone Therapy and Primary Prevention of Cardiovascular Disease. Annals of Internal Medicine 2000; 133: 933-941
31. Cramer DW: Cancer Risk Associated with Hormon Replacement. In: Menopause. Endocrinology and Management. Edited by: Seifer DB, Kennard EA. Humana Press 1999, Totowa, New Jersey
32. Lamberts SWJ, van den Beld AW, van der Lely AJ: The Endocrinology of Aging. Science 1997; 278: 419-424
33. Gapstur SM, Morrow M, Sellers TA: Hormone Replacement Therapy and Risk of Breast Cancer With a Favorable Histology. JAMA 1999; 281/22: 2091-2097
34. Hill K: The demography of menopause. Maturitas: 1996; 23: 113-127
35. Schairer C et al: Menopausal Estrogen and Estrogen-Progestin Replacement Therapy and Breast Cancer Risk. JAMA 2000; 283/4: 485-491
36. Yaffe K: Cognitive decline in women in relation to non-protein-bound oestradiol concentrations. The Lancet 2000; 356:708-712
37. Mulnard RA et al: Estrogen Replacement Therapy for Treatment of Mild to Moderate Alzheimer Disease. JAMA 2000; 283/8: 1007-1015
38. Matthews G, Ravnikar VA: Phytoestrogens and Menopause. In: : Menopause. Endocrinology and Management. Edited by: Seifer DB, Kennard EA. Humana Press 1999, Totowa, New Jersey
39. Pellizer AM et al: Reduced dietary fat intake increases parasympathetic activity in healthy premenopausal women. Clin Exp Pharmacol Physiol 1999; 26/8: 656-660
40. Chenoy R et al: Effect of oral gamolenic acid from evening primrose oil on menopausal flushing, BMJ 1994;308: 501-503
41. Pettit JL: Alternative Medicine – Black Cohosh. Clinician Review 2000; 10/4: 117-118,121. http://www.medscape.com; herunter geladen am 2000-12.17
42. Brzezinski A, Debi A: Phytoestrogens: the “natural” selective estrogen receptor modulators ? Eur J Obstet Gynecol Reprod Biol 1999; 85/1: 47-51

43. Grube B, Walper A, Wheatley D: St. John´s Wort Extract: Efficacy for Menopausal Symptoms of Psychological Origin; Advances In Natural Therapy 1999; 16/4: 177-186
44. Burghardt M: Exercise at Menopause: A Critical Difference. Medscape Women´s Health Summer 1999. http://www.medscape.com; herunter geladen am 1999-12-17
45. Hunter MS, Liao KLM: Determinants of treatment choice for menopausal hot flushes: hormonal versus psychological versus no treatment. J Psychosom Obstet Gynecol 1995; 16: 101-108
46. Nedstrand E et al: The relationship between stress-coping and vasomotor symptoms in postmenopausal women. Maturautas 1998; 31: 29-34
47. MacArthur JD: The Trouble with Tofu: Soy and the Brain.1998 http://www.brain.com
48. Martini MC et al: Effects of soy intake on sex hormone metabolism in premenopausal women. Nutr Cancer 1999; 34/2: 133-139
49. Olazábal Ulacia JC et al: Models of Intervention in Menopause: Proposal of a Holistic or Integral Model: Menopause 1999; 6/3: 264-272
50. Burger HG: The endocrinology of the menopause. Maturitas 1996; 23:129-136
51. Potthoff P et al: Menopause-Rating-Skala (MRS II): Methodische Standardisierung in der deutschen Bevölkerung. Zentralbl Gynäkol 2000; 122: 280-286
52. Lock M: Menopause in cultural context. Exper Gerontol 1994; 29: 307-317
53. Mohyi D, Tabassi K, Simon J: Differential diagnosis of hot flashes. Maturitas 1997; 27: 203-214
54. Santoro N : Concise Review:Evaluation and Mangement of the Perimenopause. Summer 1998 http://www.harrisononline.com; herunter geladen am 1999-12-17
55. Holst T: Endocrinological changes in pre- and postmenopause. Ther Umsch 1994; 51/11: 722-728
56. Pansini F et al: Trazodone: a non-hormonal alternative for neurovegetative climacteric symptoms. Clin Exp Obstet Gynecol 1995; 22/4: 341-344
57. Harlow BL, Abraham ME: Depression in Menopause. In: Menopause. Endocrinology and Management. Edited by: Seifer DB, Kennard EA. Humana Press 1999, Totowa, New Jersey
58. Kaufert PA, Gilbert P, Tate R: The Manitoba Project: a re-examination of the link between menopause and depression. Maturitas 1992; 14: 143-155
59. Ballinger CB: Psychiatric Aspects of the Menopause. J of Psychiatry 1990; 156: 773-787
60. Bullinger M, Kirchberger I: SF-36 Fragebogen zum Gesundheitszustand, Handanweisung. Hogrefe 1998, Göttingen
61. Wilbush J: What´s in a name? Some linguistic aspects of the climacteric. Maturitas 1981; 3: 1-9
62. Greene JG : Constructing a standard climacteric scale. Maturitas 1998; 29: 25-31
63. Hauser GA et al: Evaluation der klimakterischen Beschwerden (Menopause Rating Scale MRS). Zentralblatt Gynäkologie 1994;116/1:16-23
64. Hauser GA: Neue Bewertungsskala für das klimakterische Syndrom (Menopause Rating Scale MRS). Schweizer Medizinische Wochenschrift 1997 Jan 25; 127/4: 122-127
65. Gannon L: Menopausal Symptoms as Consequences of Dysrhythmia. Journal of Behavioral Medicine 1993;16/4: 387-402
66. Personal notes from the courses for paediatric osteopathy 1999-2000, Osteopathic Centre for Children (OCC London) and Osteopathisches Zentrum für Kinder (OZK Vienna)
67. Forstein DA: Managing common problems in perimenopausal women. JAOA 2000 Oct; 100:17-22.

68. Tinelli A, Torresin L, Menis T: The perimenopause. Problems and therapeutic changes. Minerva Ginecol. 2002 Aug;54(4):339-48.
69. Zapantis G, Santoro N: The menopausal transition: characteristics and management. Best Pract Res Clin Endocrinol Metab. 2003 Mar;17(1):33-52.
70. Huntley AL, Ernst E: Soy for the treatment of perimenopausal symptoms--a systematic review. Maturitas. 2004 Jan 20;47(1):1-9.
71. Geller SE, Studee L: Botanical and dietary supplements for menopausal symptoms: what works, what does not. J Womens Health (Larchmt). 2005 Sep;14(7):634-49.
72. Krebs EE et al: Phytoestrogens for treatment of menopausal symptoms: a systematic review. Evid Based Nurs. 2005 Jul;8(3):83.
73. Gass ML, Taylor MB: Alternatives for women through menopause. Am J Obstet Gynecol. 2001 Aug;185 North American Menopause Society (2 Suppl):S47-56.
74. Treatment of menopause-associated vasomotor symptoms: position statement of The North American Menopause Society. Menopause. 2004 Jan-Feb;11(1):11-33.
75. Skouby SO et al: Climacteric medicine: European Menopause and Andropause Society (EMAS) 2004/2005 position statements on peri- and postmenopausal hormone replacement therapy. Maturitas. 2005 May 16;51(1):8-14.

8.4 Research literature

Medical literature:

- PubMed http://www4.ncbi.nlm.nih.gov/PuMed
- The Cochrane Library http://www.update-software.com/cochrane/cochrane-frame.html
- JAMA Women´s Health Information Center http://www.ama-assn.org/special/womh/womh.htm
- Medscape Women´s Health http://www.medscape.com
- Obstetrics Gynecology and Women´s Health Databases http://www.mednets.com/sob-gyn.htm
- American Journal of Obstetrics and Gynecology http://www1.mosby.com/scripts
- The New England Journal of Medicine http://www.nejm.org/content/index.asp
- The Brithisch Medical Journal http://www.bmj.com
- Journal für Menopause http://members.eunet.at/k_u_p/meno.htm
- JAMA http://pubs.ama-assn.org
- Library of the National Medical Society http://www.medical-library.org
- The Lancet http://www.thelancet.com

Osteopathic literature:

- The American Osteopathic Society http://www.aoa-net.org/MediaCenter
- Osteopathic Webring http://www.osteopathicmedicine.org
- Still National Osteopathic Museum http://www.kcom.edu/museum/mursrch1.stm
- The Upledger Institut http://www.upledger.com
- DesMoines University Osteopathic Medical Center http://www.dsmu.edu/index.htm
- Osteopathy in the United Kingdom http://www.osteopathy.org.uk/index.htm
- Osteopathic Medicine Student Doctor http://osteopathic.com/ocom.html

Libraries:

- Zentralbibliothek für Medizin AKH Wien http://www.univie.ac.at/ZBMed/index.htm
- Literaturservice der Billrothgesellschaft http://www.billrothhaus.at

8.5 Background literature

1. Barral JP, Mercier P: Visceral Manipulation. Eastland Press Seattle 1988
2. Barral JP: Urogenital Manipulation. Eastland Press Seattle 1993
3. Becker RE: Life in Motion. Stillness Press Portland, Oregon 1997
4. Becker RE: The Stillness of Life. Stillness Press Portland, Oregon 2000
5. Blechschmidt E: Wie beginnt das menschliche Leben – Vom Ei zum Embryo. Cristiana-Verlag Stein am Rhein. 6. neubearbeitete Auflage 1989
6. Bock R: Anatomie des Gehirns. Interaktives Lernprogramm. Version 1.5. Urban & Fischer 1999
7. Bouchet A, Cuilleret: Anatomie topographique descriptive et fonctionelle. 1 le système nerveux central, la face, la tête et les organes des sens. 2e édition, Simep Paris 1991
8. Bouchet A, Cuilleret: Anatomie topographique descriptive et fonctionelle. 4 l´abdomen, la région rétro-péritonéale, le petit bassin, le périnée. 2e edition, Simep Paris 1991
9. De Coster M, Pollaris A: Viszerale Osteopathie. Hippokrates Verlag Stuttgart 1995
10. Dietrich R, Nagel H, Bach M: Von der Dokumentation therapeutischer Leistungen zur Evaluation therapeutischen Handelns. Seminarunterlagen. Akademie für Fort- und Sonderausbildungen AKH Wien 1998
11. Feige A, Rempen A, Würfel W, Caffier H, Jawny J: Frauenheilkunde. Urban Schwarzenberg, München – Wien – Baltimore 1997
12. Frackiewicz EJ, Cutler NR: Women´s Health Care During the Perimenopause. J Am Pharm Assoc 40(6):800-811. http://medscape.com
13. Frisch H: Programmierte Untersuchung des Bewegungsapparats. 7., neubearb. und erw. Aufl., Springer Verlag Berlin Heidelberg New York 1998
14. Giuliani A: Diagnostik der weiblichen Sexualhormone. Ärztemagazin 1-2/2001, 14-16
15. Grunewald M et al: Präparierkurs Anatomie: Ein interaktives Lernprogramm. Ullstein Medical Verlagsgesellschaft mbH & Co., Wiesbaden 1999
16. Hardy ML: Women´s Health Series: Herbs of Special Interest to Women. J Am Pharm Assoc 40/2 :234-242,2000. http://womenshealth.medscape.com
17. Hartman L: Handbook of Osteopathic Technique. Third Edition, Chapman & Hall London 1997
18. Hoppenfeld S: Klinische Untersuchung der Wirbelsäule und der Extremitäten. 2. unveränderte Aufl., Gustav Fischer Verlag Stuttgart Jena New York 1992
19. http://www.harrisononline.com
20. Kapandji IA: Funktionelle Anatomie der Gelenke. Band 1-3. 2., unveränderte Aufl., Ferdinand Enke Verlag Stuttgart 1992
21. Karlson P, Doenecke D, Koolman J: Biochemie für Mediziner und Naturwissenschaftler. 14. neubearbeitete Auflage, Georg Thieme Verlag Stuttgart – New York 1994
22. Klinke R, Silbernagl S (Hrsg.): Lehrbuch der Physiologie. 2.neugestaltete u. überarbeitete Aufl., Georg Thieme Verlag Stuttgart – New York 1996
23. Kool J, deBie R: Der Weg zum wissenschaftlichen Arbeiten. Georg Thieme Verlag Stuttgart – New York 2001
24. Lewit K: Manuelle Medizin. 7., überarbeitete und erg. Aufl., Johann Ambrosius Barth Verlag Heidelberg Leipzig 1997
25. Liem T: Kraniosakrale Osteopathie. Hippokrates Verlag Stuttgart 1998
26. Lippingcott Conrow R, Lippincott HA: A Manual of Cranial Technique. 2nd Edition , Academy of Applied Osteopathy 1948
27. Macklon NS, Fauser BCJM: Aspects of Ovarian Follicle Development throughout Life. Hormone Research 1999; 52: 161-170

28. Magoun HI: Osteopathy in the Cranial Field. Third Edition, The Journal Printing Company Kirksville 1976
29. McDowell I, Newell C: Measuring Health: A Guide to Rating Scales and Questionnaires. 2.Aufl., Oxford University Press, New York – Oxford 1996
30. Moore KL, Persaud TVN: Embryologie. Schattauer Stuttgart - New York, 4. überarbeitete und erweiterte Auflage 1996
31. Netter H: Farbatlanten der Medizin. The Ciba Collection of Medical Illustrations. Band 3: Genitalorgane. Weibliches Genitale herausgegeben von Gitsch E, Reinhold E, 2. überarbeitete Aufl., Georg Thieme Verlag Stuttgart – New York 1987
32. Netter H: Farbatlanten der Medizin. The Ciba Collection of Medical Illustrations. Band 5: Nervensystem I. Neuroanatomie und Physiologie. Hrsg. Krämer G, Georg Thieme Verlag Stuttgart – New York 1987
33. Putz R, Pabst R (Hrsg.): Sobotta. Atlas der Anatomie des Menschen. 20. Aufl., Urban Schwarzenberg, München – Wien – Baltimore 1993
34. Rauber, Kopsch: Anatomie des Menschen Lehrbuch und Atlas, Band I – IV (Hrsg.: Leonhardt H, Tillmann B, Töndury G, Zilles K). Georg Thieme Verlag Stuttgart – New York 1987 und 1988
35. Rossmanith WG: Endokrinologie des Klimakteriums. Der Gynäkologe 1998; 31: 822-831
36. Sammut E, Searle-Barnes P: Osteopathische Diagnose. Pflaum Verlag 2000
37. Seifer DB, Kennard EA (Hrsg.): Menopause. Endocrinology and Management. Humana Press, Totowa, New Jersey 1999
38. Siegenthaler W (Hrsg.): Klinische Pathophysiologie.7.neubearbeitete Aufl., Georg Thieme Verlag Stuttgart – New York 1994
39. Still AT: Osteopathy Research & Practice. Eastland Press Seattle 1992
40. Still AT: The Philosophy and Mechanical Principles of Osteopathy. Osteopathic Enterprise, Kirksville 1986
41. Stone C: Die inneren Organe aus der Sicht der Osteopathie. Verlag für Ganzheitliche Medizin Dr. Erich Wühr GmbH Kötzing / Bayer. Wald 1996
42. Sutherland WG: Contributions of Thought. Collected Writings.The Sutherland Cranial Teaching Foundation 1967
43. Thiel W: Photographischer Atlas der Praktischen Anatomie I. Bauch u. untere Extremität. Springer – Verlag Berlin Heidelberg New York 1996
44. Thiel W: Photographischer Atlas der Praktischen Anatomie II. Hals, Kopf, Rücken, Brust, obere Extremität. Springer – Verlag Berlin Heidelberg New York 1999
45. Upledger JE, Vredevoogd JD: Lehrbuch der Kraniosakraltherapie. 2., überarbeitete Aufl., Karl F. Haug Verlag Heidelberg1991

8.6 List of graphs and figures

1. Hormonal feedback system of female gonadal axis. Fig. 17.1, p. 339. Siegenthaler W (Hrsg): Klinische Pathophysiologie. 7.neubearbeitete Aufl., Georg Thieme Verlag Stuttgart – New York 1994
2. Topography of the most important hypothalamic areas and their relation to other brain areas. Fig. 1-18, p.33. Feige A, Rempen A, Würfel W. Caffier H, Jawny J: Frauenheilkunde. Urban & Schwarzenberg, München – Wien – Baltimore 1997
3. Influences on central release of GnRH. Fig. 1-19, p. 35. Feige A, Rempen A, Würfel W. Caffier H, Jawny J: Frauenheilkunde. Urban & Schwarzenberg, München – Wien – Baltimore 1997
4. Hypothalamohypophysial system. Fig. 17.10, p. 448. Klinke R, Silbernagl S (Hrsg): Lehrbuch der Physiologie. 2. neugestaltete und überarbeitete Aufl., Georg Thieme Verlag Stuttgart – New York 1996
5. Topography of circumventricular organs. Fig. 17.11, p. 449. Klinke R, Silbernagl S (Hrsg): Lehrbuch der Physiologie. 2. neugestaltete und überarbeitete Aufl., Georg Thieme Verlag Stuttgart – New York 1996
6. Truncus sympathicus / sympathetic trunk. Fig. 4.65, p. 361. Rauber, Kopsch: Anatomie des Menschen Lehrbuch und Atlas, Band IV: Topographie der Organsysteme, Systematik der peripheren Leitungsbahnen (Hrsg.: Leonhardt H, Tillmann B, Töndury G, Zilles K). Georg Thieme Verlag Stuttgart – New York 1987 and 1988
7. MRS II, total of genital complaints
8. MRS II, total of psychological complaints
9. MRS II, total of somato-autonomic complaints
10. SF-36, total of overall health
11. SF-36, total of changes of health state
12. SF-36, total of mental health
13. SF-36, total of physical pain
14. SF-36, total of physical functioning
15. SF-36, total of emotional role function
16. SF-36, total of physical role function
17. SG-36, total of social competence
18. SF-36, total of vitality

8.7 Questionnaires

This survey asks for views about your health.
Please answer each question by choosing the answer which comes closest to your condition.

All your answers will be treated as strictly confidential
Please fill in your name so that your questionnaire cannot be mixed up with somebody else's:

First name(s) .....

Surname .....

		Excellent	Very good	Good	Fair	Poor
1.	In general would you say your health is:	1	2	3	4	5

		Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
2.	Compared to one year ago, how would you rate your health in general now?	1	2	3	4	5

3. The following questions are about activities you might do during a typical day: Does your health now limit you in these activities? If so, how much?

		Yes, limited a lot	Yes, limited a little	No, not limited at all
3a.	Vigorous activities such as running, lifting heavy objects participating in strenuous sports	1	2	3
3b.	Moderate activities such as moving a table, pushing a vacuum cleaner, bowling, playing golf	1	2	3
3c.	Lifting or carrying shopping bags	1	2	3
3d.	Climbing several flights of stairs	1	2	3
3e.	Climbing one flight of stairs	1	2	3
3f.	Bending, kneeling, stooping	1	2	3
3g.	Walking more than one kilometre	1	2	3
3h.	Walking more than several blocks	1	2	3
3i.	Walking one block	1	2	3
3j.	Taking a bath or dressing	1	2	3

4.	Did your physical health cause you any problems at work or with your regular daily activities at work or at home during the past 4 weeks?		
		Yes	No
4a.	I couldn't perform my activities as long as usual	1	2
4b.	I accomplished less than I intended to	1	2
4c.	There were certain things I could not do	1	2
4d.	I had difficulty performing these things	1	2

5.	Did your mental health cause you any problems or difficulties at work or in your daily activities at work or at home during the past 4 weeks (e.g. because you felt depressed or anxious)?					
					Yes	No
5a.	I couldn't perform my activities as long as usual				1	2
5b.	I accomplished less than I intended to				1	2
5c.	I couldn't work as carefully as usual				1	2
6.	To what extent have your physical health or emotional problems interfered with your normal social activities with family, friends and neighbours during the past 4 weeks?	Not at all	Somewhat	Moderately	Quite a bit	Extremely
		1	2	3	4	5
7.	How much bodily pain did you have during the past 4 weeks?	None	Mild	Moderate	Severe	Very severe
		1	2	3	4	5
8.	To what extent did the pain interfere with your daily activities at work or at home during the past 4 weeks?	Not at all	A little bit	Moderately	Quite a bit	Extremely
		1	2		4	5

The following questions are about how you feel and how things went during the past 4 weeks. (In each line tick the figure that comes closest to how you were feeling)

9. How much of the time during the past 4 weeks ...

		All of the time	Most of the time	Very often	Some of the time	A little of the time	None of the time
9a.	Did you feel full of life	1	2	3	4	5	6
9b.	Were you very nervous	1	2	3	4	5	6
9c.	Were you feeling so low that nothing could cheer you up?	1	2	3	4	5	6
9d.	Did you feel calm and peaceful?	1	2	3	4	5	6
9e.	Did you have a lot of energy?	1	2	3	4	5	6
9f.	Did you feel downhearted and sad?	1	2	3	4	5	6
9g.	Did you feel worn out	1	2	3	4	5	6
9h.	Were you happy	1	2	3	4	5	6
9i.	Did you feel tired	1	2	3	4	5	6

10. How much of the time did your physical health or emotional problems interfere with your social activities (such as visiting friends, relatives) during the past 4 weeks?

All of the time	Most of the time	Some ot the time	A little of the time	None of the time
1	2	3	4	5

11. How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
11a. I seem to fall ill more easily than others.	1	2	3	4	5
11b. I'm as healthy as anybody I know	1	2	3	4	5
11c. I expect my health to get worse	1	2	3	4	5
11d. My health is excellent	1	2	3	4	5

12. Which of the following problems do you suffer from at present?
Please tick the appropriate column for each of your problems. If you do not have this particular problem, please tick "none" = 0.

	None	Slight	Moderate	Severe	Very severe
12a. Hot flashes, sweating (sudden intense waves of heat or sweating)	0	1	2	3	4
12b. Heart palpitations (pounding heart, fast heart rate, irregular heart beat)	0	1	2	3	4
12c. Sleep disorders (difficulty going to sleep, problems sleeping through the night, early awakening)	0	1	2	3	4
12d. Depressive moods (lack of courage, sadness, weepiness, no drive, mood swings)	0	1	2	3	4
12e. Irritability, (nervousness, tension, aggressiveness)	0	1	2	3	4
12f. Anxiety (worry, panic)	0	1	2	3	4
12g. Physical and mental exhaustion (general reduction of performance, memory lapses, poor concentration, forgetfulness)	0	1	2	3	4
12h. Sexual problems (change in sexual desire, activity and satisfaction)	0	1	2	3	4
12i. Urinary problems (difficulty with urination, frequent urination, urinary leakage)	0	1	2	3	4
12j. Vaginal dryness (sensation of dryness or burning of the vagina during sexual intercourse)	0	1	2	3	4
12k. Achy joints and muscles (pains in the area of the joints, rheumatism-like problems)	0	1	2	3	4

13. Was your last menstruation period more than 12 months ago?	Yes 1	No 2
14. Do you take any hormones (e.g. contraceptive pill, ...) or any hormone-like substances (e.g. herbal medicine)?	Yes 1	No 2
15. Are you suffering from any chronic disease?		
	Yes	No
15a. Metabolism (diabetes, thyroid, ...)?	1	2
15b. Musculoskeletal system (polyarthritis, ...)?	1	2
15c. Nervous system (multiple sclerosis,...)?	1	2
15d. Organs (asthma, morbus Crohn, ...)?	1	2
15e. Psyche (depression, ...)?	1	2
15f. Others	1	2
such as:		
16. Are you currently undergoing any therapies (psychotherapy, physical therapy,...)?	Yes 1	No 2
16a. If so, which ones?		
17. Are you taking medicine regularly?	Yes 1	No 2
17a. If so, which ones?		
18. Are you taking any medicine against menopausal problems?	Yes 1	No 2
18a. If so, which ones?		

Statistics

A Year of birth

B Did you grow up in central or western Europe?

Yes	No
1	2

C Marital status

unmarried	1
married / permanent partnership	2
divorced	3
widowed	4

D Number of children at the age of

0-2 years	
3-5 years	
6-10 years	
11-15 years	
15-18 years	
19-27 years	
28 or older	
total	

E How many persons are there in your household (including yourself)?

person	2 persons	3 persons	4 persons	5 and more
1	2	3	4	5

F Current job

self employed	1
employed	2
worker	3
housewife	4
unemployed	5
retired	6
other	7
being	

G Highest level of education (finished)

compulsory school	1
finished vocational training	2
A-level	3
Polytechnical school / university	4

Thank you

8.8 Letter to potential referring health care providers

Angelika Mückler
Praxis für Physiotherapie und Osteopathie
A-1100 Wien, Humboldtg. 31/1
Tel.: 01/ 602 44 60, Fax: 01/ 602 16 85
E-Mail: a.mueckler@netway.at

Vienna, ... 2000

Thesis "Osteopathic Treatment in Transition of Menopause"

Dear Mr / Ms .....
I am writing to submit to you information on my thesis.

Short description:

- Aim of the study is to prove that osteopathic treatment has an impact on climacteric / menopausal complaints.
- Target group: women in perimenopause with menopausal complaints who have grown up in Central or Western Europe.
- Exclusion criteria:

(1) Surgical menopause
(2) Postmenopause
(3) Cancer
(4) Systemic diseases
(5) Hormone replacement therapy (including contraceptives) or hormone-like substances such as Tamoxifen,...
(6) Therapy with corticosteroids, psychoactive drugs
(7) Homeopathic therapy or phytopharmaca for menopausal complaints, **if therapy has started or been changed within 6 weeks prior to study beginning**
(8) Organic menopausal symptoms (osteoporosis, cardiovascular diseases)
(9) Depression

- Course of study: All participating women receive *2 osteopathic treatments free of charge* at an interval of 3 weeks. Before, between and after treatment sessions participants are asked to complete questionnaires (SF-36, Menopause-Rating-Scale MRS II). For organisational and technical reasons there is a waiting period of 6 weeks (control group)

Would you be so kind and pass this information on to your patients / clients.
Do not hesitate to get in touch with me for further information.

Yours sincerely

8.9 Questionnaire to be used for determining inclusion / exclusion criteria either personally or by phone

1. Do you suffer from menopausal complaints?
2. Have you grown up in Central or Western Europe?
3. When did you have your last menstruation period?
4. Do you suffer or did you in the past suffer from any kind of cancer?
5. Are you suffering from a serious disease now?
6. Are you taking hormones or hormone-like substances?
7. Are you taking any kind of medication (including herbal or homeopathic remedies) for menopausal complaints?
8. If so, how long have you been taking them?
9. Are you taking any medication containing cortisone?
10. Are you taking any psychoactive drugs?
11. Are you undergoing any other kind of therapy for menopausal complaints?

8.10 Declaration of consent

Angelika Mückler
Praxis für Physiotherapie und Osteopathie
A-1100 Wien, Humboldtg. 31/1
Tel.: 01/ 602 44 60, Fax: 01/ 602 16 85
E-Mail: a.mueckler@netway.at

Information for participants of the study "Osteopathic Treatment in Transition of Menopause"

Aim of the study is to prove that osteopathic treatment has an impact on climacteric / menopausal complaints. The study is a thesis which is part of the training of an osteopath.

All participating women receive 2 osteopathic treatments free of charge at an interval of 3 weeks. For organisational and technical reasons there is a waiting period of 6 weeks (control group) before treatment begins.

All participants are asked to complete questionnaires (three times, which will take about 10 – 15 minutes each time) before, between and after treatment sessions.

All data is subject to data protection and medical confidentiality. Therefore data is used in encrypted form only.

Declaration of consent

I ..... hereby declare to accept the conditions of participation in the study "Osteopathic Treatment in Transition of Menopause".

Participation in the study is free of charge.
I understand that dropping out of the study does not have any consequences or disadvantages for me.

Signature: Date:

Anamnesis sheet

Motive:

Attention !	**Habits**
Heart: Blood pressure: Aneurysm: Diabetes: Neoplasia: Osteoporosis: Hernia ψ	Diet Coffee Tobacco Alcohol Milk Meat Sugar Liquid Sleep Sport

Medication	**Medical findings**
CURRENTLY	
PAST	Allergies: Vaccinations:

Head/ENT/Teeth:

Respiratory tract:

Cardia-vascular system:

Digestive tract:

Urinary tract:

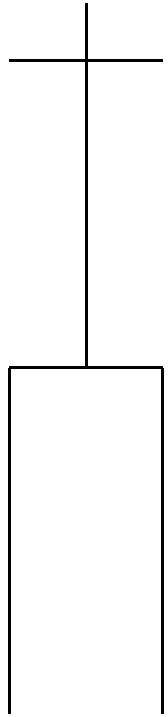
Genital tract:

Endocrine system:

Nervous system:

Musculoskeletal system:

Skin:

ψ	φ	FRONTAL	A./ P.
			
Mother	Father	Marital status	
Brothers and Sisters		Job	

8.12 Statistics frequency tables

Frequency table for AGE			
		frequency	valid percentage
valid	45	1	7,7
	46	3	23,1
	48	1	7,7
	49	2	15,4
	50	1	7,7
	51	1	7,7
	52	2	15,4
	53	1	7,7
	54	1	7,7
	total	13	100
statistics			
	N	median score	
AGE	13	49,3	

Frequency table for question B: origin			
		frequency	valid percentage
valid	1	13	100
	total	13	100
Frequency table for question C: marital status			
		frequency	valid percentage
valid	1	3	23,1
	2	6	46,2
	3	3	23,1
	4	1	7,7
	total	13	100
Frequency table for question D: total of children			
		frequency	valid percentage
valid	0	6	46,2
	1	2	15,4
	2	3	23,1
	3	2	15,4
	total	13	100
Frequency table for question E: number of persons in househ			
		frequency	valid percentage
valid	1	4	30,8
	2	4	30,8
	3	3	23,1
	4	2	15,4
	total	13	100
Frequency table for question F: job			
		frequency	valid percentage
valid	self-employed	3	23,1
	employed	10	76,9
	total	13	100
Frequency table for question G: education			
		frequency	valid percentage
	compulsatory		
valid	schooling	1	7,7
	vocational		
	training	2	15,4
	A-levels	5	38,5
	university	5	38,5
	total	13	100

Frequency table for menstruation			
		Frequency	Valid percentage
Valid	2	13	100
	Total	13	100

Frequency table for hormone remedies			
		Frequency	Valid percentage
Valid	1	2	15,4
	2	11	84,6
	Total	13	100

Chronic diseases

Frequency table for metabolism			
		Frequency	Valid percentage
Valid	2	13	100
	Total	13	100

Frequency table for musculoskeletal system			
		Frequency	Valid percentage
Valid	1	1	7,7
	2	12	92,3
	Total	13	100

Frequency table for nerves			
		Frequency	Valid percentage
Valid	2	13	100
	Total	13	100

Frequency table for organs			
		Frequency	Valid percentage
Valid	2	13	100
	Total	13	100

Frequency table for psyche			
		Frequency	Valid percentage
Valid	2	13	100
	Total	13	100

Frequency table for other items			
		Frequency	Valid percentage
Valid	1	3	23,1
	2	10	76,9
	Total	13	100

Frequency table for therapies			
		Frequency	Valid pecentage
Valid	2	13	100
	Total	13	100

Frequency table for medication			
		Frequency	Valid percentage
Valid	1	5	38,5
	2	8	61,5
	Total	13	100

Frequency table for climacteric			
		Frequency	Valid percentage
Valid	1	3	23,1
	2	10	76,9
	Total	13	100

8.13 Median scores

Statistics

	N valid	missing	median score
TGHP1	13	0	67,5
TGHP2	13	0	69,8
TGHP3	13	0	70,0
TTHCHAN1	13	0	55,8
TTHCHAN2	13	0	55,8
TTHCHAN3	13	0	63,5
TMHI1	13	0	63,1
TMHI2	13	0	60,3
TMHI3	13	0	69,2
TPAIN1	13	0	63,5
TPAIN2	13	0	63,2
TPAIN3	13	0	68,1
TPFI1	13	0	78,1
TPFI2	13	0	81,2
TPFI3	13	0	83,5
TROLEM1	13	0	61,5
TROLEM2	13	0	71,8
TROLEM3	13	0	76,9
TROLPH1	13	0	59,6
TROLPH2	13	0	69,2
TROLPH3	13	0	71,2
TSOC1	13	0	76,0
TSOC2	13	0	68,3
TSOC3	13	0	74,0
TVITAL1	13	0	46,9
TVITAL2	13	0	48,5
TVITAL3	13	0	48,8
children	13	0	1,1
persons / HH	13	0	2,2

Statistics

	N valid	missing	median score
TTGEN1	13	0	73,1
TTGEN2	13	0	81,4
TTGEN3	13	0	83,3
TTPSYCH1	13	0	68,3
TTPSYCH2	13	0	65,9
TTPSYCH3	13	0	77,9
TTSOM1	13	0	65,4
TTSOM2	13	0	76,4
TTSOM3	13	0	75,5

Statistics

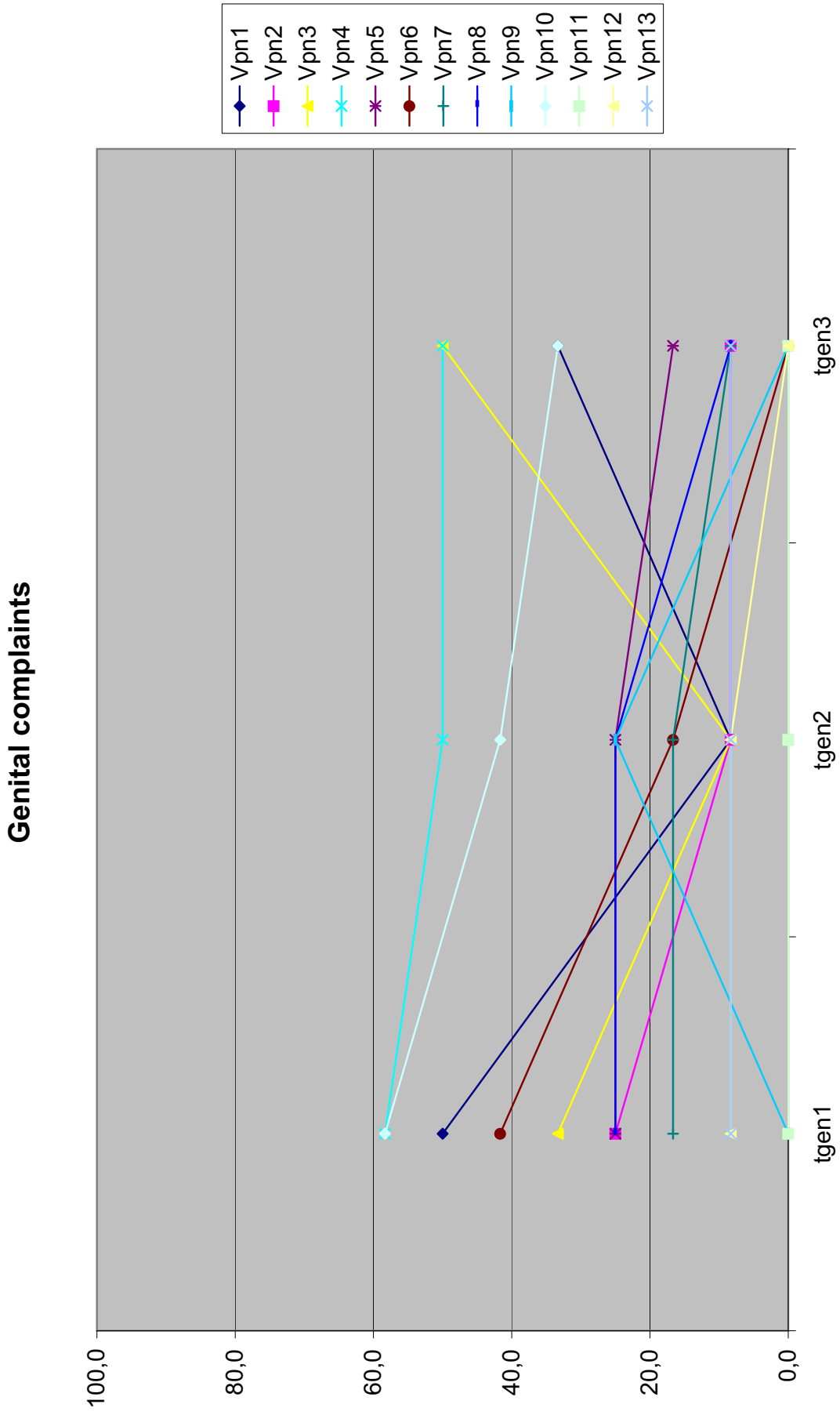
	N valid	missing	median score
TGEN1	13	0	26,9
TGEN2	13	0	18,6
TGEN3	13	0	16,7
TPSYCH1	13	0	31,7
TPSYCH2	13	0	34,1
TPSYCH3	13	0	22,1
TSOM1	13	0	34,6
TSOM2	13	0	23,6
TSOM3	13	0	24,5

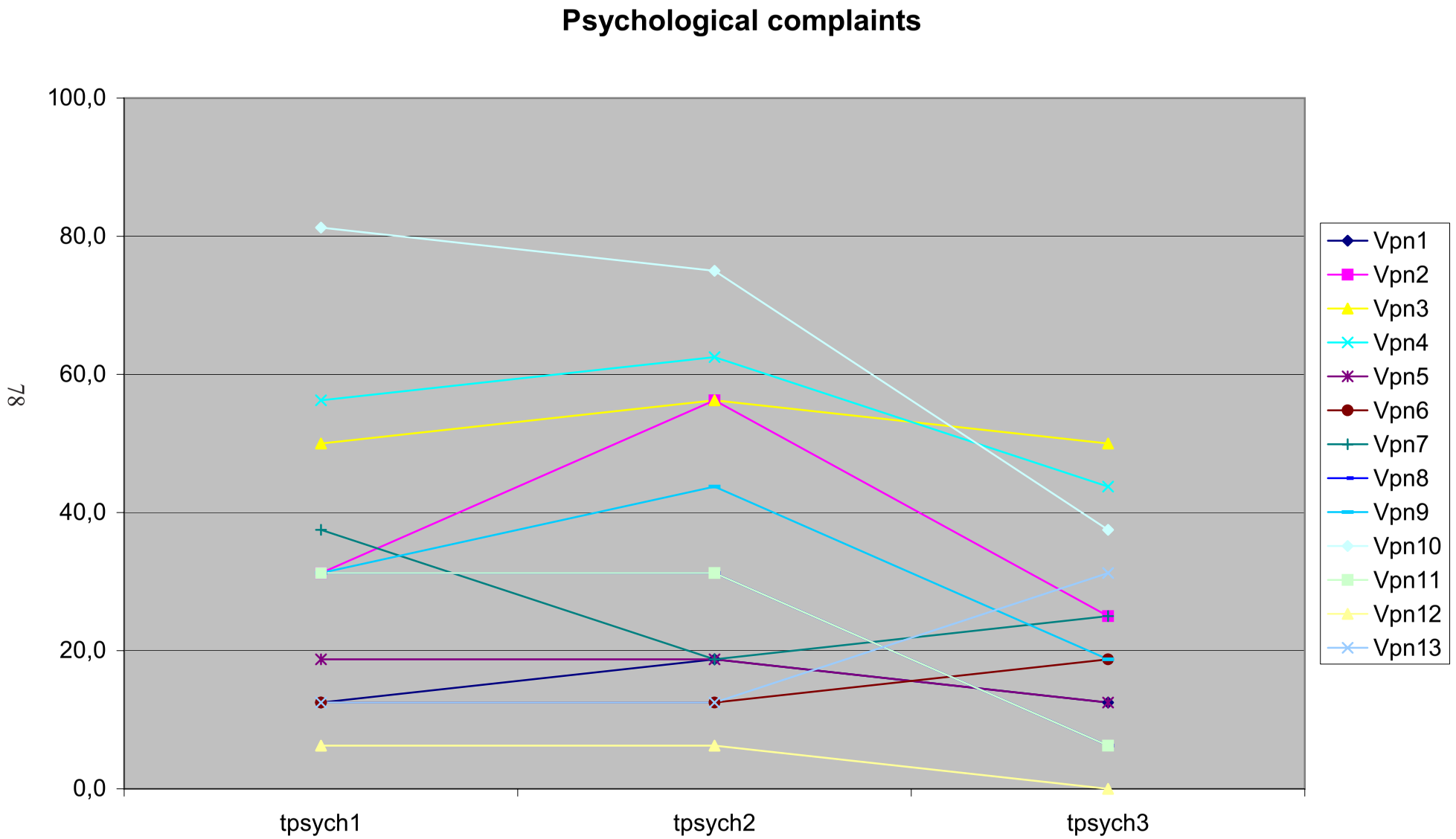
8.14 Indiviadual data (n=13)

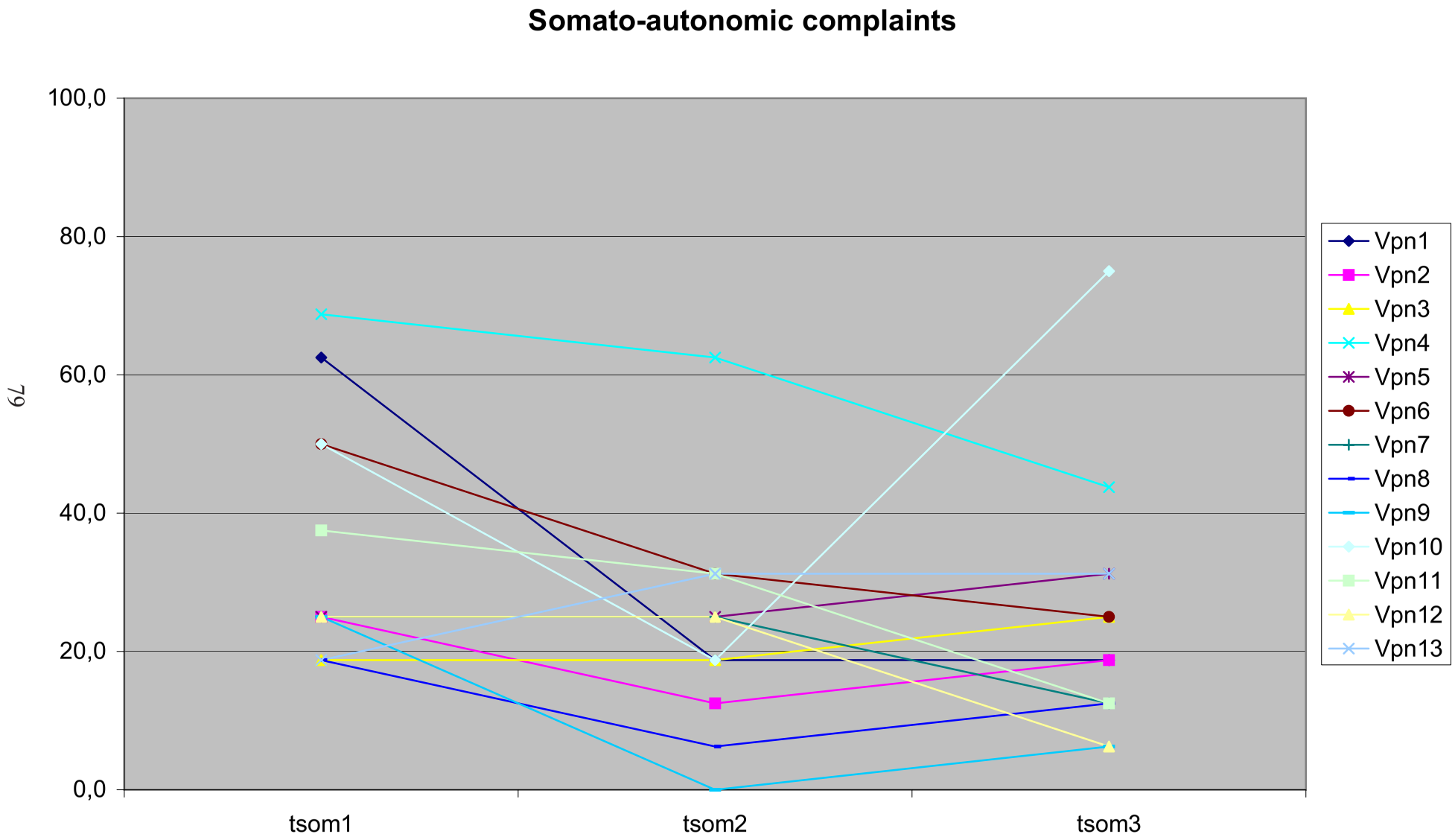
	tgen1	tgen2	tgen3	tghp1	tghp2	tghp3	thchang1	thchang2	thchang3	tmhi1	tmhi2	tmhi3
Vpn1	50,0	8,3	33,3	67,0	67,0	82,0	50,0	50,0	50,0	60,0	64,0	76,0
Vpn2	25,0	8,3	8,3	92,0	87,0	82,0	25,0	25,0	0,0	56,0	52,0	64,0
Vpn3	33,3	8,3	50,0	52,0	45,0	40,0	50,0	75,0	75,0	56,0	44,0	40,0
Vpn4	58,3	50,0	50,0	47,0	35,0	52,0	50,0	50,0	50,0	52,0	64,0	44,0
Vpn5	25,0	25,0	16,7	62,0	77,0	57,0	50,0	75,0	50,0	76,0	76,0	88,0
Vpn6	41,7	16,7	0,0	72,0	67,0	45,0	25,0	25,0	75,0	76,0	80,0	88,0
Vpn7	16,7	16,7	8,3	92,0	92,0	87,0	50,0	25,0	25,0	52,0	72,0	64,0
Vpn8	25,0	25,0	8,3	72,0	72,0	52,0	25,0	25,0	25,0	64,0	76,0	80,0
Vpn9	0,0	25,0	0,0	60,0	62,0	97,0	100,0	75,0	0,0	76,0	12,0	92,0
Vpn10	58,3	41,7	33,3	20,0	52,0	50,0	25,0	25,0	0,0	36,0	44,0	28,0
Vpn11	0,0	0,0	0,0	62,0	72,0	87,0	50,0	50,0	25,0	72,0	56,0	84,0
Vpn12	8,3	8,3	0,0	82,0	87,0	92,0	25,0	25,0	25,0	84,0	84,0	88,0
Vpn13	8,3	8,3	8,3	97,0	92,0	87,0	50,0	50,0	75,0	60,0	60,0	64,0
	tpain1	tpain2	tpain3	tpfi1	tpfi2	tpfi3	tpsych1	tpsych2	tpsych3	trolem1	trolem2	trolem3
Vpn1	62,0	62,0	84,0	100,0	100,0	100,0	12,5	18,8	12,5	66,7	100,0	100,0
Vpn2	84,0	74,0	100,0	85,0	85,0	95,0	31,3	56,3	25,0	33,3	0,0	100,0
Vpn3	84,0	41,0	31,0	90,0	90,0	85,0	50,0	56,3	50,0	66,7	66,7	66,7
Vpn4	31,0	31,0	31,0	40,0	55,0	55,0	56,3	62,5	43,8	33,3	0,0	33,3
Vpn5	62,0	74,0	74,0	90,0	95,0	95,0	18,8	18,8	12,5	100,0	66,7	100,0
Vpn6	42,0	42,0	51,0	45,0	40,0	25,0	12,5	12,5	18,8	100,0	100,0	100,0
Vpn7	62,0	62,0	74,0	95,0	100,0	100,0	37,5	18,8	25,0	0,0	100,0	100,0
Vpn8	64,0	74,0	74,0	65,0	80,0	85,0	31,3	31,3	6,3	100,0	100,0	100,0
Vpn9	74,0	100,0	100,0	70,0	70,0	80,0	31,3	43,8	18,8	0,0	100,0	66,7
Vpn10	41,0	52,0	41,0	55,0	55,0	75,0	81,3	75,0	37,5	0,0	0,0	0,0
Vpn11	62,0	62,0	84,0	95,0	95,0	100,0	31,3	31,3	6,3	100,0	100,0	100,0
Vpn12	84,0	84,0	100,0	95,0	100,0	100,0	6,3	6,3	0,0	100,0	100,0	100,0
Vpn13	74,0	64,0	41,0	90,0	90,0	90,0	12,5	12,5	31,3	100,0	100,0	33,3

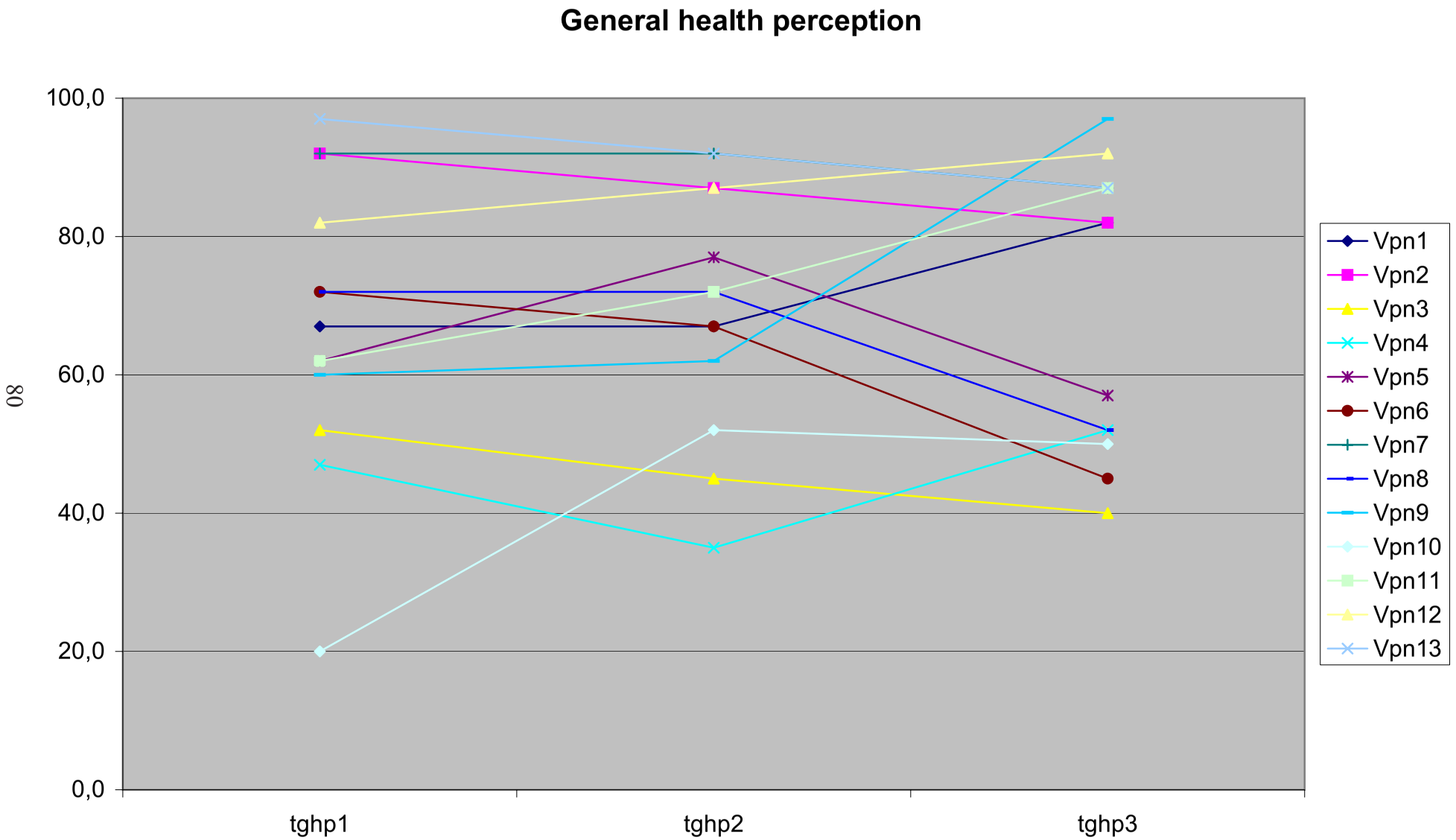
	trolph1	trolph2	trolph3	tsoc1	tsoc2	tsoc3	tsom1	tsom2	tsom3	tvital1	tvital2	tvital3
Vpn1	100,0	100,0	100,0	100,0	100,0	100,0	62,5	18,8	18,8	45,0	45,0	50,0
Vpn2	25,0	50,0	100,0	75,0	50,0	75,0	25,0	12,5	18,8	40,0	30,0	55,0
Vpn3	0,0	100,0	50,0	62,5	75,0	25,0	18,8	18,8	25,0	35,0	40,0	20,0
Vpn4	25,0	0,0	25,0	50,0	50,0	50,0	68,8	62,5	43,8	45,0	45,0	35,0
Vpn5	100,0	100,0	100,0	87,5	87,5	87,5	25,0	25,0	31,3	60,0	55,0	75,0
Vpn6	75,0	25,0	25,0	50,0	75,0	50,0	50,0	31,3	25,0	45,0	45,0	10,0
Vpn7	100,0	100,0	100,0	100,0	87,5	87,5	25,0	25,0	12,5	40,0	60,0	60,0
Vpn8	50,0	75,0	50,0	75,0	50,0	75,0	18,8	6,3	12,5	40,0	55,0	55,0
Vpn9	0,0	75,0	75,0	87,5	37,5	100,0	25,0	0,0	6,3	60,0	65,0	85,0
Vpn10	0,0	25,0	25,0	25,0	50,0	62,5	50,0	18,8	75,0	25,0	35,0	25,0
Vpn11	100,0	50,0	100,0	100,0	50,0	100,0	37,5	31,3	12,5	60,0	30,0	70,0
Vpn12	100,0	100,0	100,0	87,5	87,5	87,5	25,0	25,0	6,3	50,0	60,0	75,0
Vpn13	100,0	100,0	75,0	87,5	87,5	62,5	18,8	31,3	31,3	65,0	65,0	20,0
	ttgen1	ttgen2	ttgen3	ttpsych1	ttpsych2	ttpsych3	ttsom1	ttsom2	ttsom3	tthchan1	tthchan2	tthchan3
Vpn1	50,0	91,7	66,7	87,5	81,3	87,5	37,5	81,3	81,3	50	50	50
Vpn2	75,0	91,7	91,7	68,8	43,8	75,0	75,0	87,5	81,3	75	75	100
Vpn3	66,7	91,7	50,0	50,0	43,8	50,0	81,3	81,3	75,0	50	25	25
Vpn4	41,7	50,0	50,0	43,8	37,5	56,3	31,3	37,5	56,3	50	50	50
Vpn5	75,0	75,0	83,3	81,3	81,3	87,5	75,0	75,0	68,8	50	25	50
Vpn6	58,3	83,3	100,0	87,5	87,5	81,3	50,0	68,8	75,0	75	75	25
Vpn7	83,3	83,3	91,7	62,5	81,3	75,0	75,0	75,0	87,5	50	75	75
Vpn8	75,0	75,0	91,7	68,8	68,8	93,8	81,3	93,8	87,5	75	75	75
Vpn9	100,0	75,0	100,0	68,8	56,3	81,3	75,0	100,0	93,8	0	25	100
Vpn10	41,7	58,3	66,7	18,8	25,0	62,5	50,0	81,3	25,0	75	75	100
Vpn11	100,0	100,0	100,0	68,8	68,8	93,8	62,5	68,8	87,5	50	50	75
Vpn12	91,7	91,7	100,0	93,8	93,8	100,0	75,0	75,0	93,8	75	75	75
Vpn13	91,7	91,7	91,7	87,5	87,5	68,8	81,3	68,8	68,8	50	50	25

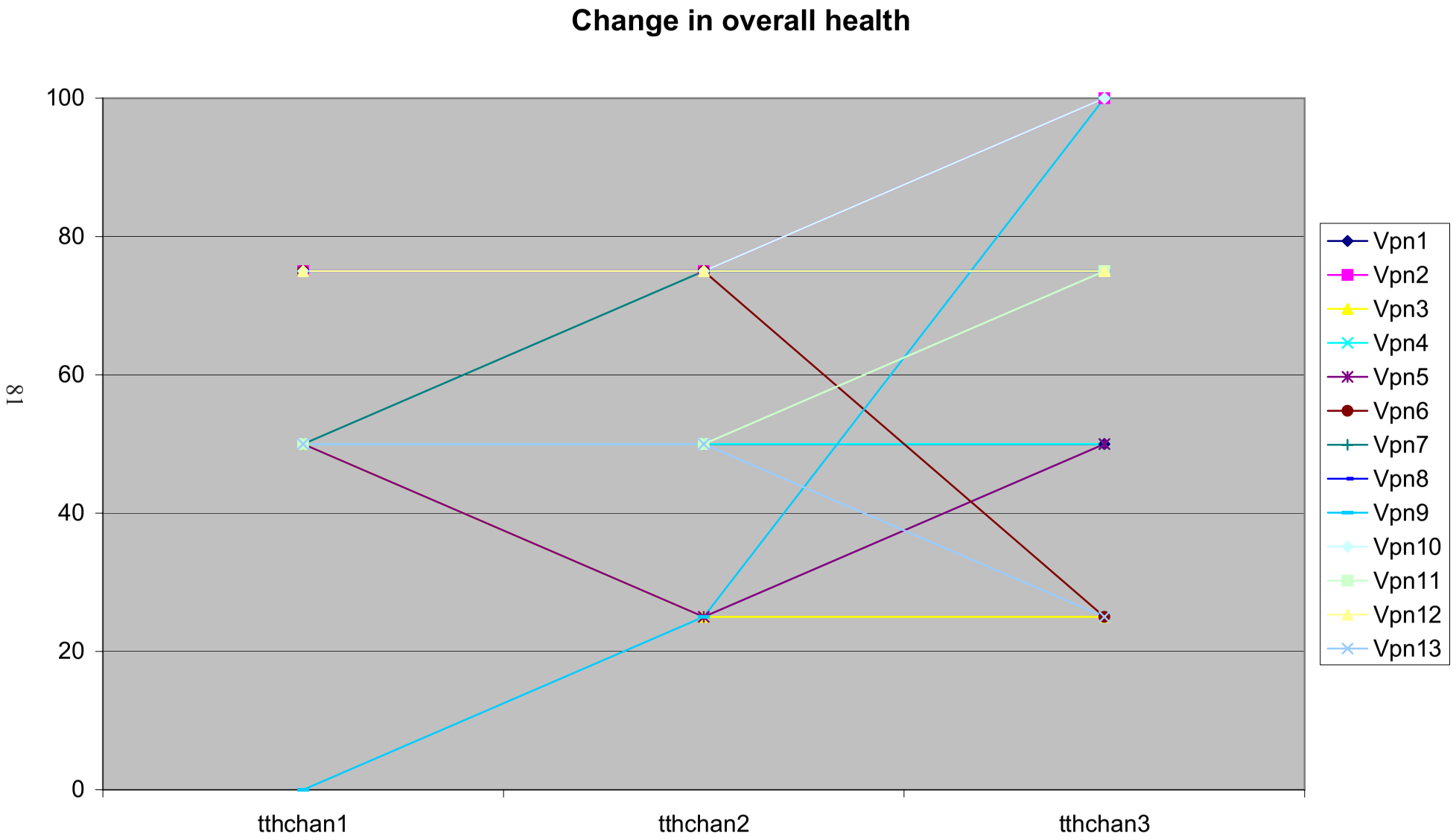
8.15 Tables of individual data

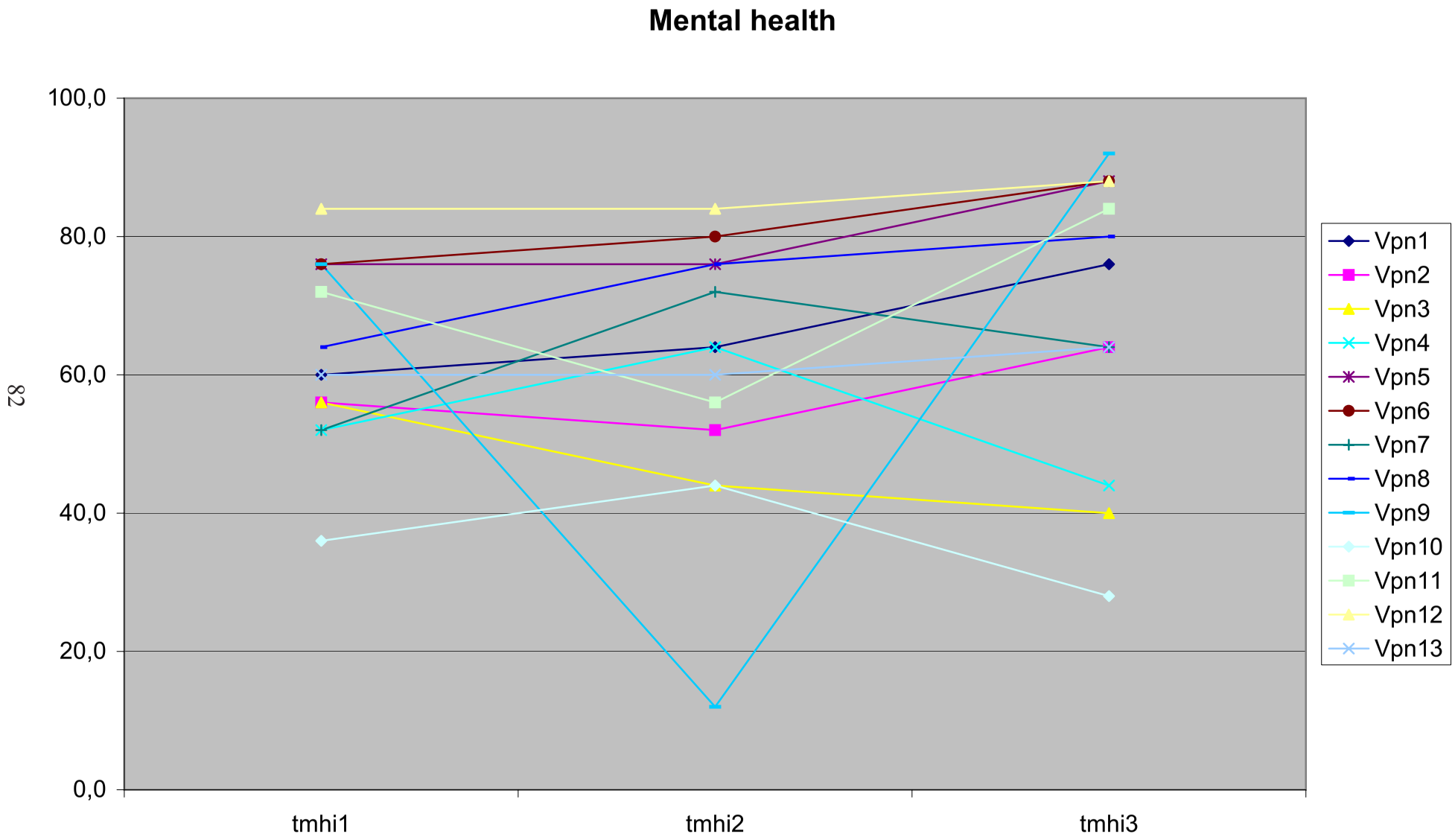


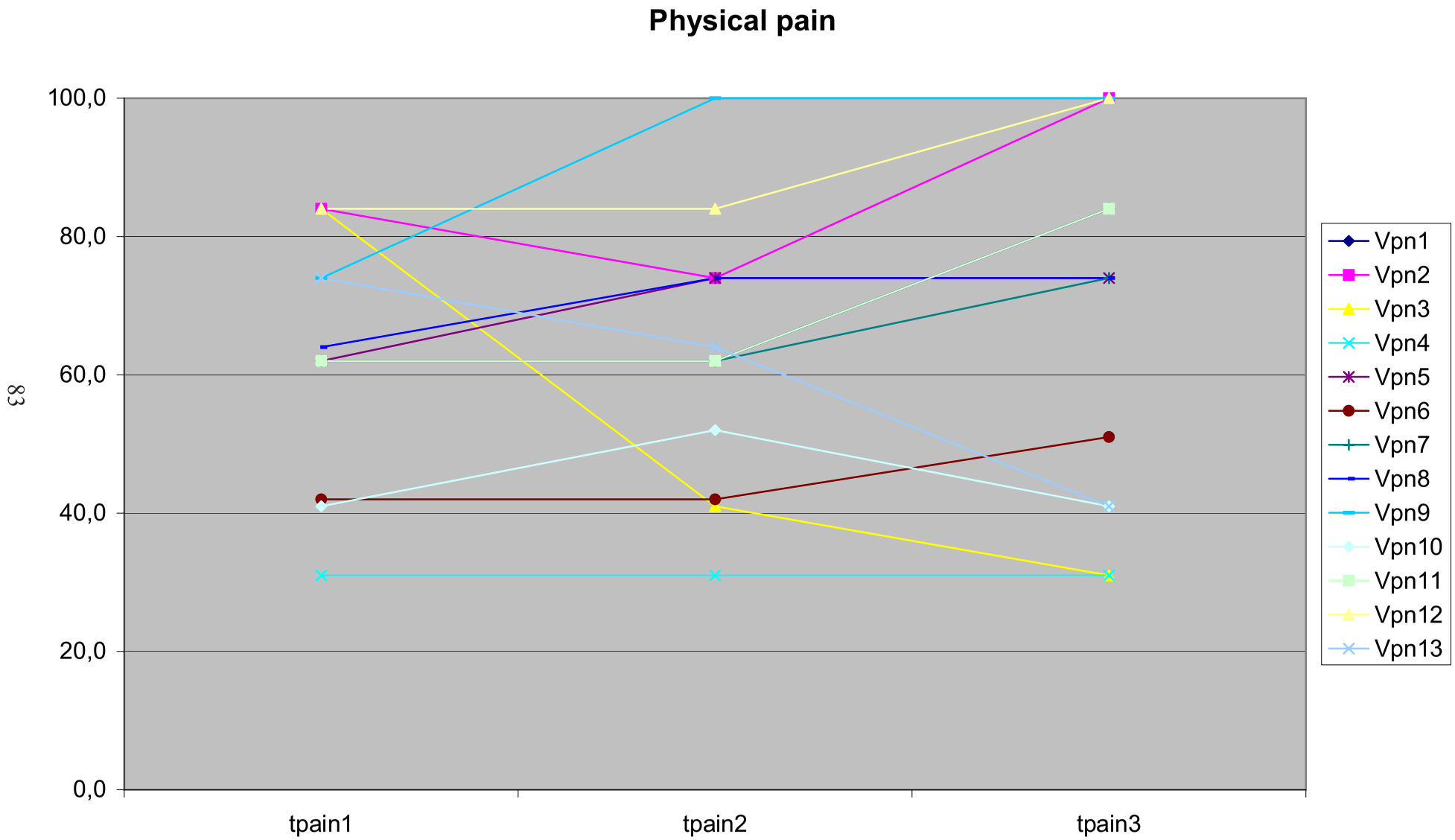

Psychological complaints
100,0
80,0
60,0
40,0
20,0
0,0
78
tpsych1
tpsych2
tpsych3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13

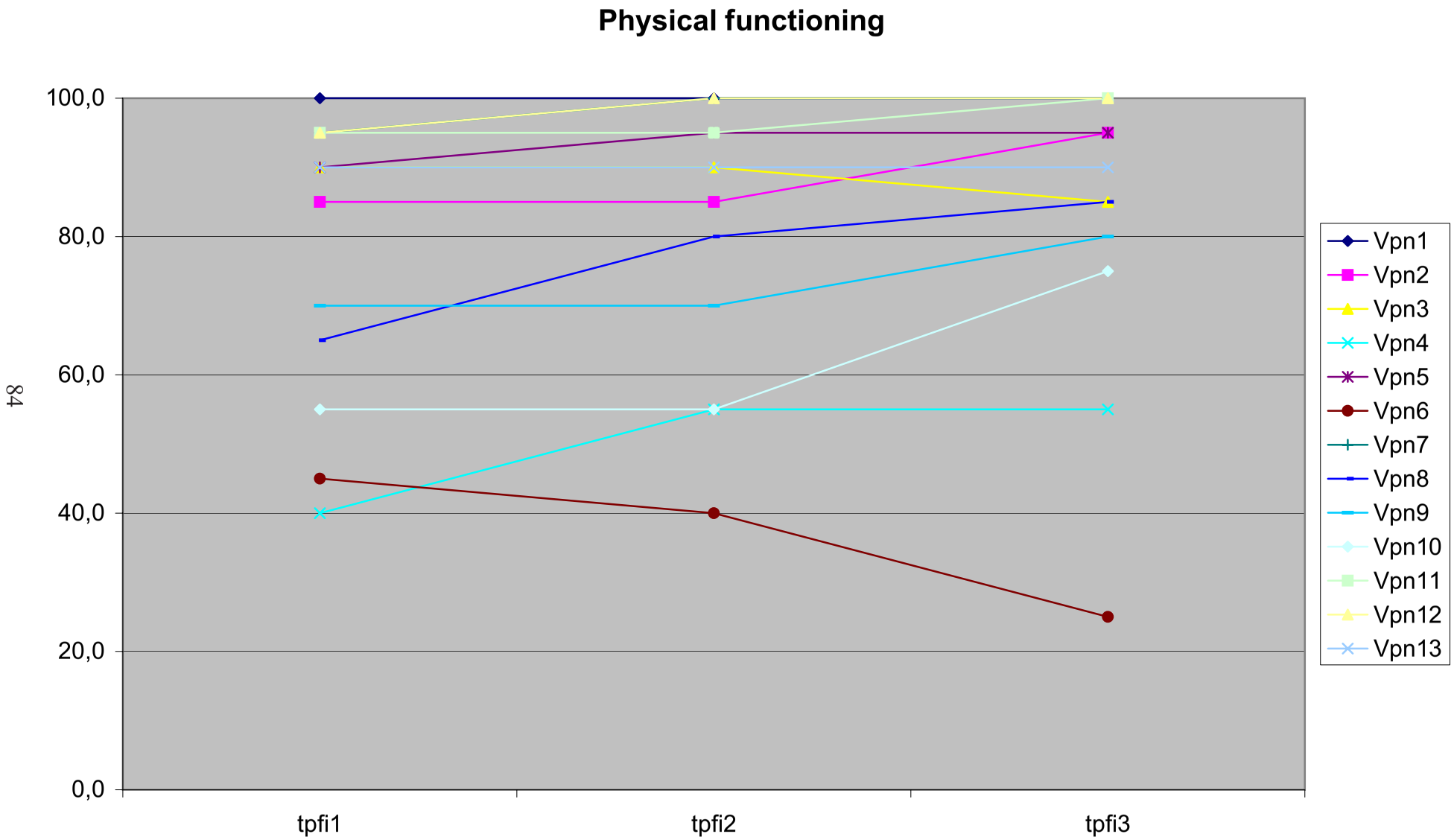

Somato-autonomic complaints
100,0
80,0
60,0
40,0
20,0
0,0
tsom1
tsom2
tsom3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13

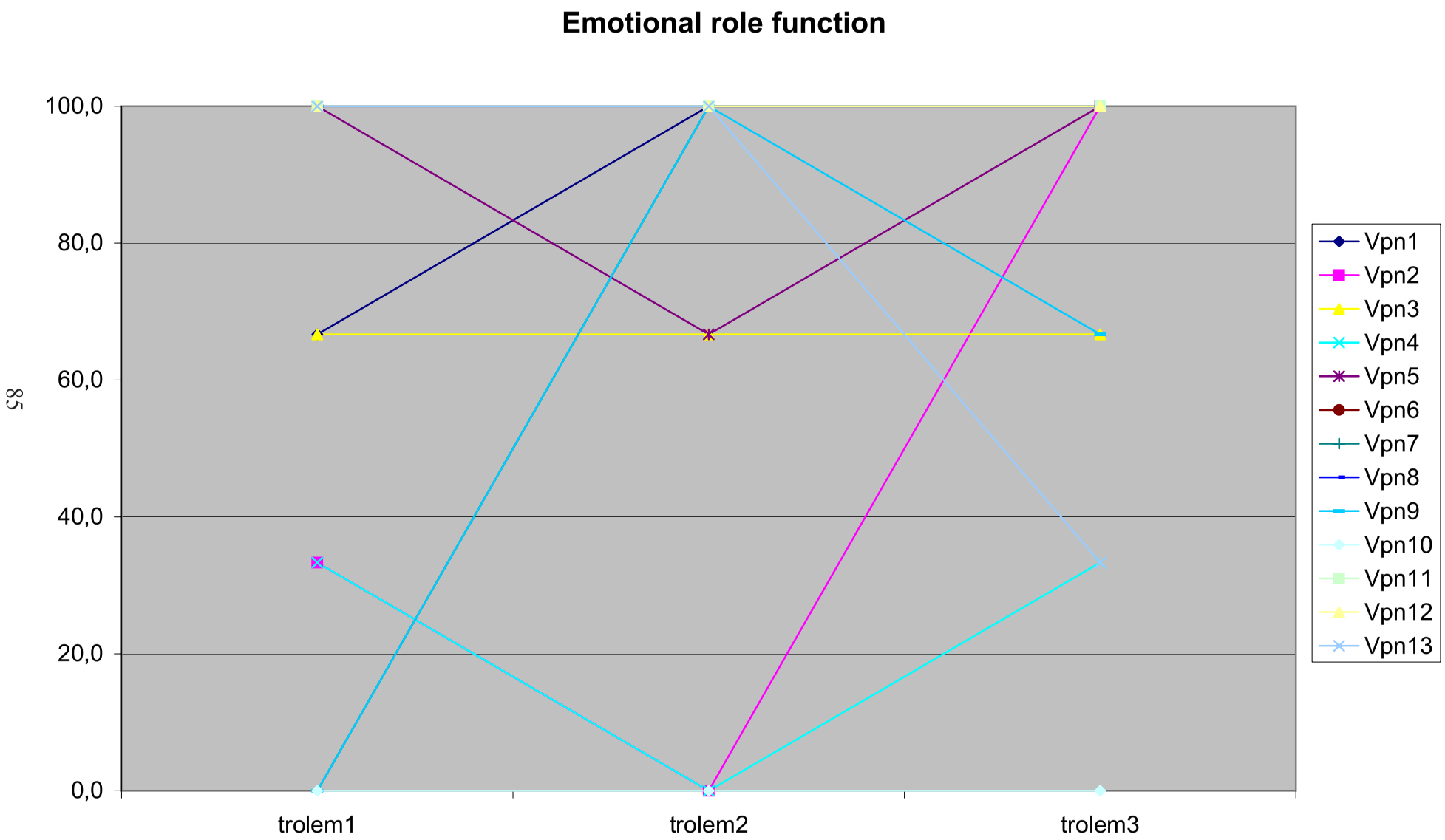

General health perception
100,0
80,0
60,0
40,0
20,0
0,0
80
tghp1
tghp2
tghp3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13

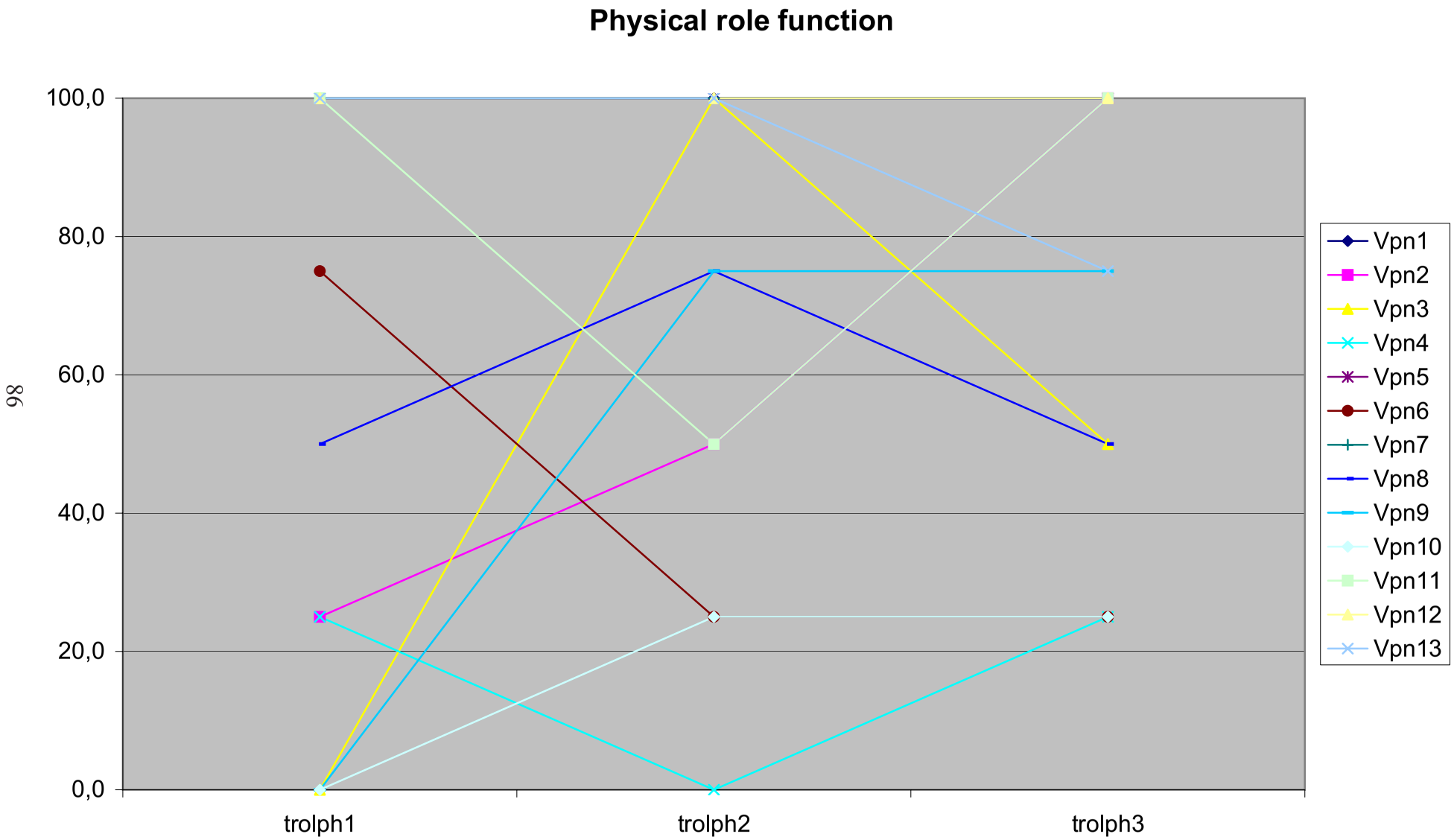

Change in overall health
100
80
60
40
20
0
tthchan1
tthchan2
tthchan3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13

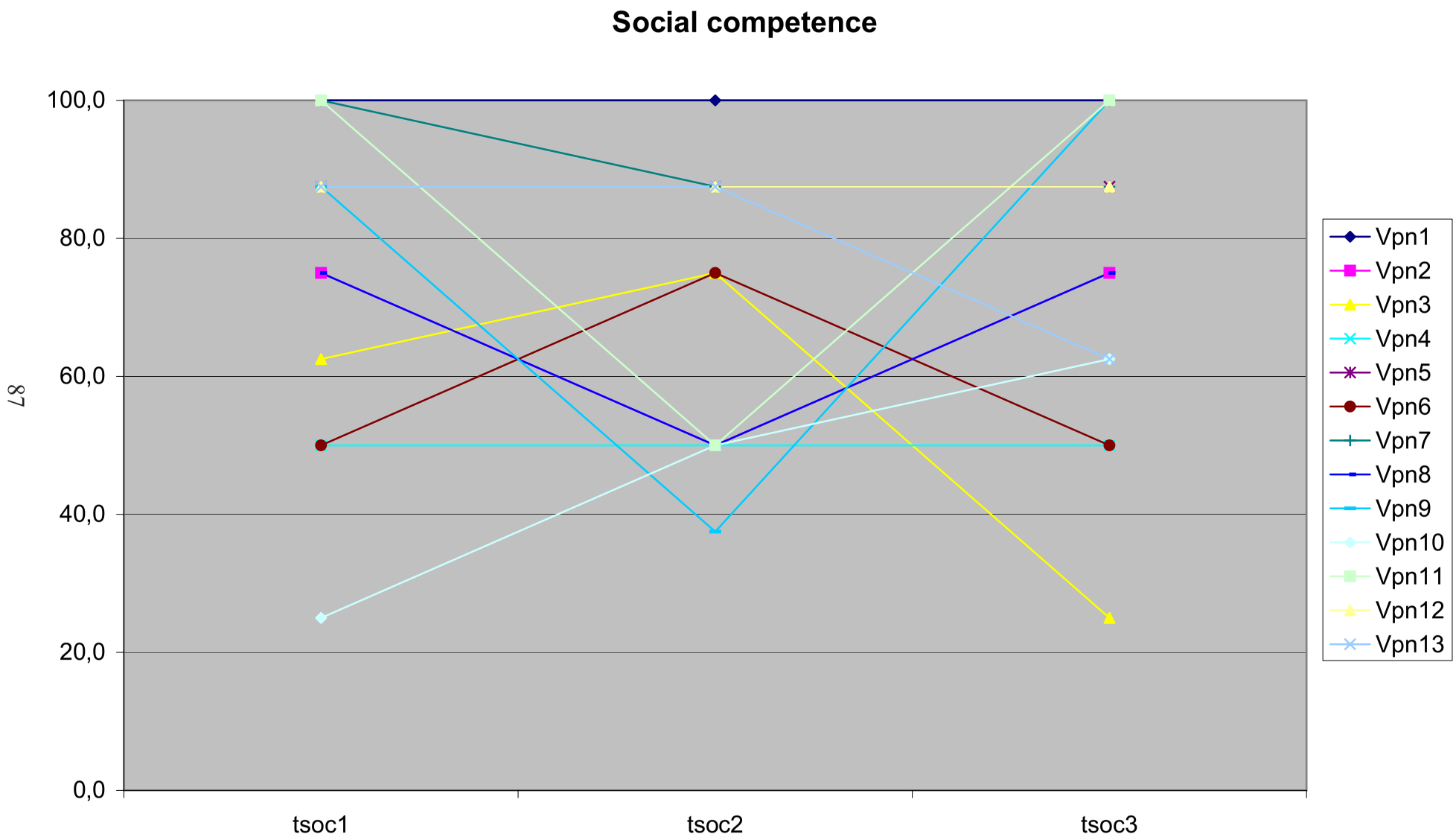

Mental health
100,0
80,0
60,0
40,0
20,0
0,0
tmhi1
tmhi2
tmhi3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13

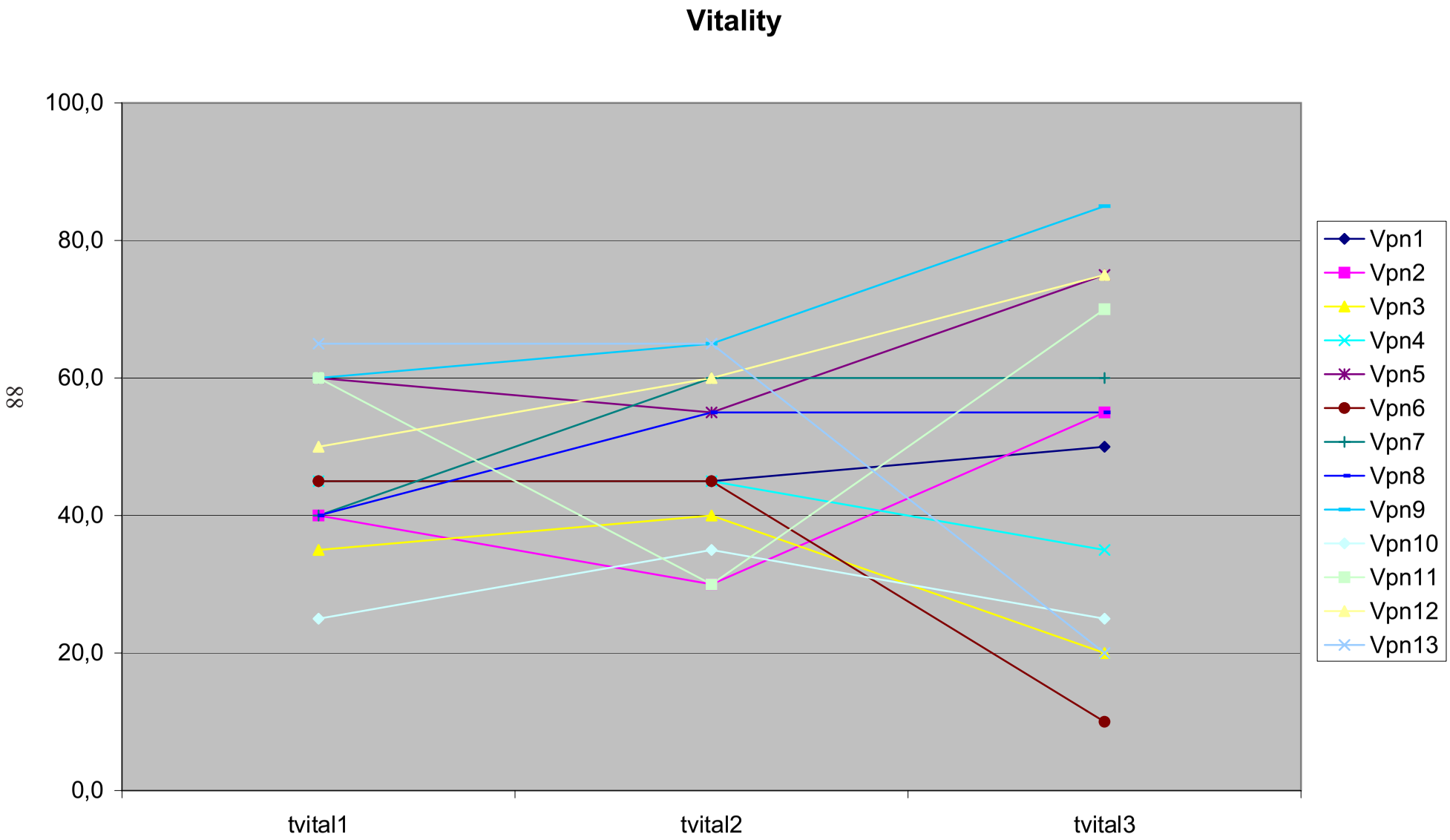

Physical pain
100,0
80,0
60,0
40,0
20,0
0,0
tpain1
tpain2
tpain3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13


Physical functioning
100,0
80,0
60,0
40,0
20,0
0,0
tpfi1
tpfi2
tpfi3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13


Emotional role function
100,0
80,0
60,0
40,0
20,0
0,0
trolem1
trolem2
trolem3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13


Physical role function
100,0
80,0
60,0
40,0
20,0
0,0
trolph1
trolph2
trolph3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13


Social competence
100,0
80,0
60,0
40,0
20,0
0,0
tsoc1
tsoc2
tsoc3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13


Vitality
100,0
80,0
60,0
40,0
20,0
0,0
%
tvital1
tvital2
tvital3
Vpn1
Vpn2
Vpn3
Vpn4
Vpn5
Vpn6
Vpn7
Vpn8
Vpn9
Vpn10
Vpn11
Vpn12
Vpn13