

Postnatal Emotional Disorder and Osteopathy

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Danksagung (Preface)

Die Durchführung der folgenden Studie wurde mir an der Geburtsstation des Bezirkskrankenhauses Kufstein möglich gemacht. Meinen Dank möchte ich vor allem Hr. Primarius Dr. Rainer Heider und seinem Team aussprechen. Mit viel Enthusiasmus und Engagement unterstützte mich das Pflorgeteam der Geburtsstation, unter der Leitung von Fr. Natja Bachmair und das Team der Hebammen, unter der Leitung von Fr. Elisabeth Manzl in meinem Vorhaben. Nur so war es mir möglich, die Studie in einem Zeitraum von 15 Wochen durchzuführen.

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„Geboren wird nicht nur das Kind durch die Mutter,
sondern auch die Mutter durch das Kind“

Gertrud von Le Fort (1876 - 1971), dt. Dichterin

Abstract

Objective: It was the aim of this study to examine, whether the occurrence of maternity blues can be prevented by a single osteopathic treatment within the first three days postpartum.

Subjects and Methods: Twenty puerperal women who had delivered at the Bezirkskrankenhaus (district hospital) Kufstein were treated osteopathically within the first three postpartum days in addition to standard in-hospital care. Another twenty puerperal women were assigned to the control group. At the tenth day postpartum, the emotional state of the puerperal women was surveyed by a validated questionnaire (Edinburgh Postnatal Depression Scale, EPDS). The subjects of the control group received the osteopathic treatment after the survey. Neither of the women knew, what group they belonged to.

Results: Groups are comparable with regard to age and the relative number of primiparous women.

No significant differences between the two groups can be observed with regard to the EPDS total score ($p=0.26$) and the single statements of the EPDS (minimum $p=0.08$).

However, according to the actual data, risk for depressive diseases is lower in the test group than in the control group. Mean total scores are 4.5 (SD: 3.8) in the test group and 6.3 (SD: 5.4) in the control group.

The most distinct group differences could be observed in question 5 of the EPDS: Women treated osteopathically have less often felt scared or panicky for no very good reason than the controls ($p= 0.08$).

Conclusion: The current data show, that a single osteopathic treatment had no significant influence on the emotional state of puerperal women in early puerperium. The general validity of these results is restricted due to the low number of participants (20 per group).

Key words: Osteopathy, postnatal/-partal dysphoria, postnata/-partal depression, delivery, maternity blues, puerperium, childbed, Edinburgh Postnatal Depression Scale, EPDS

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1. Introduction

At work with babies and infants, appreciable attention is drawn to often unexpected perceptions of women in childbed arising straight after delivery.

In contrast to their own and also social expectations, many mothers experience the first days after delivery as burdening. They describe to feel blue and anxious for one or several days after giving birth. They talk about crying attacks, the feeling „not to cope with the situation”, and - as a result - of arising feelings of guilt.^{1/2/3}

According to social conventions, a mother should be happy, put aside her own needs and cope with the new life requirements with ease.⁴ In numerous conversations with mothers, whose babies were treated in my practice and in talks with midwives and medical orderlies of the puerperal ward of the Bezirkskrankenhaus (district hospital) Kufstein, I noticed, that affective instability in the early puerperium is very frequent.

Thus, I started to engage in this issue. Already in ancient history, dysphoric disorders in the early puerperium have been described (cf. chapter 1.2.) and nowadays it has been shown in different studies (Bergant et al.1998, Strobl 2002, Gonidakis et al. 2007) that up to 50% of all women in childbed encounter a short-time postnatal depressive disorder.

With the foundation of the International Marcé Society in the UK in the nineteen-eighties - a multidisciplinary association of obstetricians, psychiatrists, midwives, social workers and others⁵ - the research in postnatal mental disorders is being systematised.

The main focus is the early detection and especially the early treatment of postnatal emotional disorders in the early puerperium. It is the central aim to shorten the duration and to reduce the severity of postnatal depressions and thus to minimise their after-effects for mother and child.⁶

¹ Kemps et al 2003

² Dix 1986

³ Salis 2003

⁴ Rohde 2004

⁵ www.marce-Gesellschaft.de

⁶ Klier, Hohlagschwandter 2002

In modern attendance during puerperium, it is catered noticeably more for the individual needs of mother and child in order to prevent the occurrence of postnatal dysphoria (maternity blues) or, if necessary, to recognise and treat it at an early stage.

Facilitation of delivery, also with alternative therapies (e.g. homeopathy and acupuncture), rooming-in, individual lactation counselling and responding to psycho-social changes during puerperium by the midwife, accompany mother and child optimally into the new life situation.⁷

This begs the question, if an osteopathic treatment of women in childbed within the first three days after delivery in addition to the regular in-patient attendance during puerperium can influence the occurrence of these displeasures in a positive way.

Pregnancy and delivery affect body, mind and soul of a woman and require a high adaptability. Osteopathy is a therapeutic approach that considers man in a holistic way. The physical body, the mind and the soul (with the emotions, which are cross-linked via the neurohormonal system) are associated with each other and it is regarded, that every single part is interrelated with the others.⁸

It is the goal of this study to demonstrate, whether postnatal osteopathic treatment can strengthen the body's autoregulation capacities (according to the osteopathic model) in that way, that burdens by pregnancy and delivery can be worked up more easily and thus, the psychological state of mothers in the early puerperal phase can be influenced in a positive way.

Hereafter, the contentual structure and methodology of this study will be sketched.

⁷ Harder 2005

⁸ Liem 2001

Content and structure of the study

After some definitions of terms and a historical outline about postnatal emotional disorders in general, a comparison and differentiation of the single forms of postnatal emotional disorders will be presented in chapter 2.

Since this study deals with the most moderate form of postnatal emotional disorders during early puerperium, the postnatal dysphoria (maternity blues), this topic will be described in more detail in chapter 3. A further essential part of chapter 3 is the aetiology of postnatal dysphoria, since this gives information on potential inclusion- and exclusion criteria for the participation of puerperal women in this study.

Problem and goal of the study are defined in chapter 4.

The chapters 5 and 6 describe the physiological changes in puerperium, as well as the standard care for the puerperal women at the „Bezirkskrankenhaus (BKH) Kufstein“ (District Hospital Kufstein), where the study was carried out.

In the actual study, the mental and psychological state of mothers with a regular attendance during puerperium is contrasted to the state of those, who were additionally treated once osteopathically.

The methodology of this study is described in detail in chapter 7. This work was conceived as a clinical study with quasi-experimental design and match-controlled group assignment of the subjects.

Finally, the statistical evaluation and the discussion follow in chapter 8 and 9, respectively.

1.1. Definition of Terms

Prenatal and postpartal/postnatal

The term „prenatal“ originates from the Latin vocabulary and means „before birth“.⁹

This term is used predominantly in prenatal diagnostics. It is concerned with prenatal examinations that serve the diagnosis of genetic and developmental disorders of the foetus, as well as the early detection of complications during pregnancy.¹⁰

The terms “postpartal” and “postnatal” are the opposite of “prenatal”. Again, these terms origin in Latin vocabulary, “post” means “after” and “partus” stands for “delivery”. Thus, the expression ”postpartal” means „after delivery“, whereas „natus“ translated from Latin stands for „birth“. Consequently, “postnatal” means „after birth“.¹¹ In German terminology primarily the term “postpartal” is used, whereas the term “postnatal” prevails in English-speaking countries.¹²

With regard to the common classification described above, the term “postnatal” will be used in the following, equivalent to the term postpartal in the actual context.

Puerperium/Childbed

Puerperium is the specialist term for childbed. It origins in Latin, too („puer“ means “child”, „parere“ means “to deliver”).¹³

Childbed initially was the common name of the bed, where the woman rested after delivery of her child.

In the German-speaking area, this term is used in a transferred sense for the period after delivery. Childbed (puerperium) starts immediately after delivery of the placenta and lasts for 6-8 weeks. It is differentiated into two periods.

⁹ Pschyrembel 1982

¹⁰ Brockhaus 2004

¹¹ Herrmann 2006

¹² Rohde 2004

¹³ Harder 2005

“Early puerperium” denotes the first ten days after delivery; “late puerperium” is the period from the tenth postnatal day until the end of the sixth or eighth week. Within this time, the body of the mother returns to almost the same state that was present before pregnancy.¹⁴

1.2. Historical Outline

In order to show, that postnatal emotional disorders are not only a phenomenon of modern times, I will present a historical outline concerning research in postnatal emotional disorders.

Emotional disorders during the puerperium were reported yet in the ancient world. A first specific description of a puerperal psychosis can be found in Hippocrates’ third book about epidemics in 400 BC.¹⁵

For a long time it was assumed, that this disorder represents no disease, but a “typical female reaction” or a certain form of hysteria. „Hysteria“ is the Greek word for „uterus“. These assumptions were popular up to the modern era.¹⁶

In the 19th century, when it was started to look for a relation between the physical and mental changes during pregnancy, a connection with puerperal disorders was found.

A major researcher of this time was the Frenchman Marcé.¹⁷ Together with colleagues he defined the basis of the disorder.

- 1.Cases, arising during pregnancy
- 2.Cases, occurring shortly after delivery
- 3.Cases that occurred some weeks or longer after delivery

¹⁴ Dudenhausen et al 2003

¹⁵ Fallgatter et al 2002

¹⁶ Strobl 2002

¹⁷ French psychiatrist Louis Victor Marcé (1828-1864). The Marcé-Society, that was named after him, does not only apply itself to the exploration and the quest for the causes of the „madness of the pregnant, freshly delivered and breast-feeding“, but also to outreach work and information of the population. (quoted according to Ahrer, 2006, translated by Woisetschlager)

In a humoral medical way they regarded psychophysiological reasons as triggers for postnatal mental disorders. Insufficient flow of the lochia and of menstrual blood and dysfunction of milk secretion were considered as main reasons.

Influenced by psychoanalysis, postpartum puerperal disorders were interpreted totally new in the beginning of the 20th century. Manias and severe depressions during puerperium were treated predominantly.¹⁸

In the middle of the 20th century, “maternity blues“ was mentioned the first time by Victoroff (1952) and Molony (1952) as a less important disorder during puerperium. There was still a lack of detailed definitions and examinations, but with “maternity blues” the non-psychotic postpartum puerperal depressions came to the fore.

¹⁸ Strobl 2002

2. Classification of Postnatal Emotional Disorders

Nowadays, affective puerperal disorders are classified depending on severity and duration in:

- Postnatal dysphoria (“maternity blues”)
- Postnatal depression
- Postnatal psychosis

In the following section, these terms shall be explained and delimited from each other.

2.1. Postnatal Dysphoria (Maternity Blues)

The postnatal dysphoria, also called maternity blues, “general down mood”, or in German “Heultage“ (“crying days”), is rated as the mildest form of puerperal disorders. Normally, it sets in within the first days after birth and lasts between some hours up to several days.¹⁹ Approximately 45%-50% (Bergant et al.1998, Strobl 2002, Complojer 2006, Gonidakis et al. 2007) of all puerperal women react with such short-term postnatal emotional disorders in the first week after delivery.

2.2. Postnatal Depression

The postnatal depression is a form of a „major depression“. Most often, it manifests approximately three to four weeks after delivery and persists for a few weeks up to twelve months.²⁰ According to O’Hara (1996), 10 -15% of the young mothers suffer a depression during the first months after delivery. This puerperal disorder requires treatment in most cases, because it leads to a derangement of the mother-child interaction.²¹

¹⁹Hinterhuber et al. 1997

²⁰ Riecher-Rössler et al 2001

²¹ Klier et al. 2002

2.3. Postnatal Psychosis

The postnatal psychosis is the most severe form of the puerperal disorders. In most cases, it begins very acutely within the first two to four weeks after delivery. Depending on the arising symptoms, it is either a manic or a schizophrenic psychosis.²²

According to Harding (1989), incidence is in a range between one and four of 1000 deliveries.

This classification of puerperal disorders is used coherently in different studies of postnatal dysphoria²³, in the scientific literature²⁴, as well as by international approved professional organisations.²⁵ The current study refers to the effect of osteopathic treatment on the postnatal dysphoria/maternity blues exclusively. In the following chapter, I will describe the fundamentals and characteristics of the postnatal dysphoria/maternity blues.

For reasons of simplicity, consequently the term maternity blues will be used instead of postnatal dysphoria, since it is more common in the English language.

²² Rohde 2004

²³ Strobl 2002, Fabjan 2004

²⁴ Kemps et al. 2003, Fallgatter 2002, Hinterhuber et al. 1997, Robinson et al. 1986

²⁵ Marcé-Society, Beyondblue

3. Fundamentals of the Maternity Blues

This study exclusively deals with maternity blues, which shall be investigated for possibly being influenced by osteopathic treatment administered in the early puerperium. Therefore, I will describe this disorder in detail. In particular, I will go into possible causes for the development of maternity blues. These are the basis for inclusion- and exclusion criteria for this study.

The maternity blues (also known as postnatal dysphoria, general down mood or in German as “Heultage” (crying days)) is the mildest form of the clinical presentations of postnatal emotional disorders. A down mood arises within the first ten days after delivery, persisting most often for three to five days and with a culminating point around the eighth day postpartum.²⁶

The maternity blues is not accepted as real disorder. However, the International Classification of Diseases (ICD-10) for „mental or behavioural disorders associated with the puerperium, not elsewhere classified“ comprises the code F 53.0, whereby this in essence refers to postnatal depression only.²⁷ The maternity blues is regarded as physiological transitory syndrome without clinical significance.²⁸

Nevertheless, the puerperal women undergo high mental strain, and prevalence is high (see above). This fact is reason enough to face up this phenomenon of maternity blues, especially because this field is still being trivialised - „... normally, maternity blues does not persist longer than 24 to 38 hours, fades by itself and requires no further treatment“ (according to Fabjan, 2004, 22).

Bergant et al. (1998) examined in their study „Prevalence of depressive disorders in early puerperium by means of EPDS (EPDS: Edinburgh Postnatal Depression Scale, cf. Chapter 7.2), how far maternity blues is accompanied by stable depressive symptoms. An EPDS total score of >9.5 indicated an at least slight depressive disorder in 20% of the puerperal women.

²⁶ Helmchen et al.2000

²⁷ Dilling et al.1993

²⁸ Rohde 2004, Fallgatter et al. 2002

It is described several times, that this slight depressive disorder represents a risk factor for a later postnatal depression.^{29/30} Also Fabjan (2004) and Bergant (2005) demonstrated, that maternity blues has a significant relevance in the development of a later postnatal depression.

3.1. Clinical Presentation of the Maternity Blues³¹

The clinical presentation of maternity blues is characterised by various symptoms in different combinations. Examples for guiding symptoms are:

-Crying: According to Stein (1982), crying is characterised as short episode of one or two minutes within the first hours after delivery. This can be an expression of negative mood or the women describe it as „tears of joy“.

Furthermore, longer crying periods, also with a stronger markedness are reported. In most cases, these occur within the first ten days postpartum. Therefore, in German this phenomenon is denominated as “Heultage” (crying days).

-Depressive mood: In most cases, the women do not have classical depressive symptoms, but undergo them in alleviated form. They describe minor ups and downs, are tired of something, or have little verve. Ballinger et al. (1979) and Riley (1979) observed a relation between former depressive diseases and maternity blues.

-State of exhilaration: Some puerperal women show effusive enthusiasm, predominantly on the first day postpartum. The women are happy about the baby and the successful delivery (Stein, 1980). These feelings of exhilaration change suddenly, but only slightly, and signs of other blues symptoms may arise approximately on the fourth day after delivery.

²⁹ Beck 2001

³⁰ Lusskins et al.2008

³¹ quoted according to Hartung and Hartung 1998

-Mood swings: Extreme mood swings/emotional lability without subjective reason can arise within a single day or from one day to the other. This can range from depressive episodes to exhilaration (Ballinger et al., 1979).

-Confusion and forgetfulness: Some women in childbed describe a feeling of confusion, forgetfulness or a lack of the ability to concentrate (Kennerly and Gath, 1989).

-Irritability and hostility: These symptoms culminate on the fourth or fifth day after delivery. A lack of empathy of their environment might be the reason.

-Ego disturbances: Mostly, feelings of irreality and alienation appear short after delivery. They can range from conceiving parts of the body as strange to anxieties (Stein, 1982).

-Negative maternal attitudes: Contrary to general expectations, mothers do not show positive feelings for the newborn (Stein, 1982).

-Headaches: Woman in childbed often describe persisting headache.

Sleep disorders: Even puerperal women who have been being separated from their newborn baby sleep shorter (Karacan et al., 1969). The women describe augmented excessive dreams, bad dreams and sleep disruptions.

-Other symptoms: Puerperal women complain of sleep disorders, prostration, cluelessness, agitation and worries for the baby.

3.2. Aetiology of Maternity Blues

The development of maternity blues seems to be multifactorial and the causes can be classified as follows:

- biological/physiological factors
- mental and psychosocial factors
- gynaecological and obstetrical factors
- anthropological/culture-bound factors

3.2.1. Biological/Physiological Factors

In investigations of biological and physiological causes, predominantly hormonal dysregulations as consequence of physiological hormonal adaptation after delivery are discussed as triggers of maternity blues.

The increase and/or decrease of adrenal-, thyroid-, sexual- and pituitary hormones as well as changes in vasopressin, β -casein, β -endorphin and in other body's own substances are being investigated.

The following table according to Strobl (2002) gives an overview of the most important studies about endocrinological causes of puerperal disorders:

Year	Author	Examination
1956	Bower, Altschulte	Rebound overproduction of steroid hormones
1960	Schneeberg	Sheehan syndrome
1961	Railton	Temporary cortisol deficiency
1962	Hamilton	Hypothyroidism
1968	Yalom	Progesterone decrease
1976	van Zerssen	Elevated cortisol level

Year	Author	Examination
1979	Ballinger	High cAMP-level in urine
1980	Handly	Lacking increase in tryptophan, reduced free tryptophan
1983	Burrows	Oestrogen withdrawal, progesterone theory, FSH, LH, LH-RH, TSH,STH
1984	Newnham	β –Endorphin withdrawal
1984	Stein	Vasopressin
1988	Nyberg	β -Casein
1989	Hamilton	Pituitary insufficiency
1992	Bonnin	Cortisol level
1994	Heidrich	17- β -Estariol, progesterone, prolactin
1995	Meyer	Erythropoietin
1996	Magiakou	Corticotropin-releasing hormone
1998	Ijuin	Thyroid dysfunction
2000	Maes	Prolyl endopeptidase (PEP)
2001	Granger	Progesterone
2002	Troisii	Cholesterol level

Table 1: Overview of some studies about endocrinological causes of puerperal disorders (Strobl 2002, 4-5).

In these manifold studies no agreement is achieved about hormonal causes of maternity blues. However, the following substances are thought to be the most probable triggers: Oestrogens, thyroxine, tryptophan, cortisol and a disequilibrium between oestrogen and progesterone.³²

³² Strobl 2002

The predominantly investigated physiological factors are weight change, changes in electrolyte, and sleep behaviour. According to Stein (1980) a weight loss can be observed in mothers on the fourth and fifth day after delivery. This weight loss is significantly associated with the contemporary onset of mood swings.

In another study, Stein et al. (1981) investigated the urine of women for changes in electrolyte after delivery. They could not find a direct connection with mood swings, but a coincidence in the moment of the onset of the changes in electrolyte and of the maternity blues.

Sleep behaviour in connection with maternity blues was investigated by Wilkie et al. in 1992 and by Swain et al. in 1997. In both studies, a connection between sleep behaviour (predominantly disturbed night sleep) and the occurrence of postnatal mood swings was noticed.

3.2.2. Mental and Psychosocial Factors

The research of psychological reasons for maternity blues began in the middle of the 20th century with investigations about the connection of maternity blues with psychiatric diseases, psychological factors, and the social environment.

Maternity blues and psychiatric disorders:

Manifold early studies deal with the association of maternity blues and previous non-puerperal psychiatric disorders. Minoru Tsukasaki et al. (1991) report a connection of previous history of psychiatric disorder and maternity blues, whereby this could not be verified by Kennerly/Gath (1989).

However, in a metaanalysis (O'Hara et al. 1996) it was realised, that a preceding psychiatric episode represents a predictor for the development of maternity blues but also of depression.

Psychological and psychosocial factors responsible for the development of puerperal disorders were investigated for the first time in the nineteen-seventies. The feeling not to be loved by the partner, an unexpected and unintended pregnancy, the fact to live separated from the partner, and general stressful experiences during pregnancy were regarded as predictors for the development of puerperal disorders at that time.^{33/34}

Also later studies confirm a connection between general mentally burdening situations and the arising of puerperal disorders.³⁵

The attitude of the women towards pregnancy and delivery as predictor for maternity blues is described very early by Nilleson et al. in 1970. They relate maternity blues with a defeating or ambivalent attitude towards pregnancy and delivery.

Kennerly and Gath (1989) observed a connection between fear of delivery and maternity blues. Hartung and Hartung verified in 1998, that women with more severe prenatal

³³ Braverman et al. 1978

³⁴ O'Hara 1991

³⁵ Hartung/Hartung 1998 / Strobl 2002

apprehensions, particularly of an unexpected date of delivery and of the feeling of subjection during delivery, more often developed blues symptoms after delivery.

According to Hartung and Hartung (1998), this supports the correlation between high values in the neuroticism scale and the accumulated occurrence of maternity blues, described in the literature.

The social factors of demographical background, partnership and parity were investigated most frequently. There are significant results, that in all studies dealing with the demographical background no connection between social structure and maternity blues could be found.³⁶ The maternity blues covers all social strata. It is determining, how satisfied the mother is with her actual social situation.

The influence of the partnership status is discussed controversially. O'Hara (1991) and Sauer (1993) describe relationship between problems in partnership and maternity blues and in the study by Hartung and Hartung (1998) all women with partnership problems developed a maternity blues. In contrary Strobl (2002) could not make out a connection between partnership and maternity blues.

The question, whether primiparous women suffer maternity blues more often, is answered differently in the literature, too. While no connection between primiparity and maternity blues is described in most older studies ^{37/38}, predominantly later studies come to a positive result. Primiparous women rather tend to develop maternity blues.³⁹

In this context, also the age of the mother was investigated, whereby a connection with advanced maternal age and primiparity is described.⁴⁰

³⁶ Ballinger 1979

³⁷ Stein 1980

³⁸ Pitt 1973

³⁹ Bölter et al. 1986, Hartung/Hartung 1998, Strobl 2002

⁴⁰ Hartung/Hartung 1998

3.2.3. Gynaecological and Obstetric Factors

Apart from these psychological and social factors, also obstetric factors are mentioned as possible causes for the development of maternity blues. Gynaecological problems during pregnancy, mode and experience of delivery, breast-feeding behaviour and place of delivery as well as delivery assistance were predominantly investigated. Summing up the results, delivery by caesarean section, elevated delivery stress, and necessary medical care by paediatrists are significant predictors for the development of a maternity blues.^{41/42/43}

3.2.4. Anthropological Causes - Culture-bound Factors

The anthropological explanatory model proceeds on the assumption of a culture-bound syndrome.⁴⁴

The delivery itself, as well as the first time after delivery are an important phase for mother and infant. In many cultures, rites and customs grew that supported the mother during the biological adaptation as well as social reorientation after delivery. These rites and customs have developed gradually and in several cases they represent an evolutionary, adapted process.⁴⁵

Human ethological investigations in the traditional culture of the Eipo in the highlands of Papua New Guinea show, for example, that maternity blues, as well as postnatal depression are almost unknown there. The main reasons are considered to be the compliance of evolutionary developed rites such as instant body contact after birth, breast-feeding, protection against disturbance of the mother, natural support of the mother by experienced women, appreciation by the society and natural delivery.^{46/47}

Stern und Kruckman (1983) are of the opinion, that maternity blues in Western culture represents a culture-bound syndrome. The lack of structuredness during the puerperal

⁴¹ Fabjan 2004

⁴² Strobl 2002

⁴³ Bergant 2005

⁴⁴ Strobl 2002

⁴⁵ Dammann et al. 2001

⁴⁶ Schiefenhövel 1988

⁴⁷ Schiefenhövel 1994

period, little social acknowledgement and little emotional as well as physical support of the mother lead to the development of maternity blues.⁴⁸

Furthermore, Ugarriza (1992) blames a lack of specific accompanying rituals during pregnancy, delivery and puerperium in Western orientated societies for puerperal disorders. The more a culture diverges from traditional habits, which have consolidated by biological and cultural evolution, the more the probability increases to form a dysfunction.

Summary:

Pregnancy and delivery of a baby is a physical, mental, social and also cultural challenge for each woman, going hand in hand with drastic changes in life.

After revision of the studies of the authors cited above, it becomes obvious, that there cannot exist any exclusive and defined trigger for maternity blues. Genesis of a maternity blues seems to be caused multifactorially. However, some risk factors can be observed cumulatively at the occurrence of maternity blues.

In the psycho-social field, pre-existing mental lability and aggravated conditions during pregnancy, such as sanitary and medical problems of the mother and social stress are mentioned.

For the most part, there is agreement among the authors concerning the obstetrical factors. Delivery by caesarean section, an increased delivery burden, such as operative deliveries (delivery of the baby with involvement of vacuum, forceps, peridural anaesthesia PDA) and necessary medical care for the baby turn out to be significant predictors for the development of maternity blues.

These defined risk-factors will be considered in the specification of inclusion- and exclusion criteria for the subjects in this study. Puerperal women, irrespective of parity and age will participate in this study. However, primiparity, multiparity and age of the women will be taken into account in the statistical evaluation.

⁴⁸ ziti. nach Hofecker Fallahpour et al 2005

4. Problem and Goal of this Study

Due to the multifactorial genesis of maternity blues, as an osteopath, I wonder, whether it is possible to improve mothers' ability to cope with mental strain in early puerperium by an osteopathic treatment straight after delivery. Is it possible to influence the autoregulatory capacity of the body, so that pregnancy- and delivery stress can be mentally worked up more easily?

Thus, it is the goal of this study to investigate, whether the occurrence of maternity blues can be prevented by a single osteopathic treatment within the first three postpartum days.

Especially the severe physical and hormonal changes and adaptations that are necessary in the postnatal period represent an enormous physical performance. All pregnancy-caused changes of the last nine months, of the genital organs as well as the overall organism have to be reversed.

In the following chapter, I will concentrate on these necessary physiological changes in puerperium.

5. Physiology of the Puerperium

Puerperium (or childbed) is the designation for the period from the delivery of the whole placenta to the finalisation of the reversion of the changes caused by pregnancy and delivery. This process lasts approximately six to eight weeks. In this time, hormone production and the body reorganise again and the organism reverts to the prepregnant state.⁴⁹

Dudenhausen et al. (2003), describe four processes:

- Involutional processes
- Wound healing processes
- Lactation
- Resumption of the normal ovarian function

Additionally, there are some substantial extragenital changes.

Involutional processes:

These processes are predominantly regulated by hormonal adjustments.

After delivery of the placenta (as an organ for hormone synthesis), there is a marked decline in the placental hormones chorionic gonadotropin (HCG), human placental lactogen (HPL), as well as gestagens and oestrogens.

Uterus, pelvic floor, abdominal wall, pelvic girdle, bladder, and intestines are relocated again and revert to their prepregnant shape and nature. The postpartum contractions, which are predominantly induced by the increased release of oxytocin, reduce the blood supply of the uterus muscles and thus cause a depletion of muscle fibres.

Moreover, the contractions support the discharge of wound secretion (lochia) from the uterus. Both lead to a weight reduction and decrease of the uterus from approximately 1000 g to 50-70 g during puerperium.

⁴⁹ Dudenhausen et al 2003

The decrease in hormone concentration brings about the washout of pregnancy caused oedemas, too, and blood count and body weight normalise again.⁵⁰

Wound healing processes:

Postnatal bleeding (lochia) is considered as indication of tissue repair of the surface area where the placenta adhered to the mother.

There, residual tissue becomes liquefied by the immigration of granulocytes, lymphocytes and phagocytes, and the formation of fresh endometrium is possible.⁵¹

Lactation:

Lactation is regulated by hormones, too. After delivery of the placenta and the consequent decrease in the concentration of placental steroid hormones, milk secretion in the mammary glands is induced. It takes approximately ten days until lactation and milk release function optimally.

Lactation is sustained by the sucking of the infant which causes elevated oxytocin release and prolactin production. Oxytocin stimulates the contraction of the myoepithelia of the alveolar wall, so that the milk is squeezed out by muscle contractions.⁵²

Resumption of the ovarian function:

After delivery of the placenta and the sudden decrease in steroid hormone concentration, the anterior lobe of hypophysis resumes full function again.

Gonadotrope hormones are generated and the ovarian function is re-established again. Normally, after delivery the woman has her first menses within the first five to six weeks.⁵³

⁵⁰ Harder 2005

⁵¹ Dudenhausen 2003

⁵² Schmidt-Matthiesen et al 2005

⁵³ Schmidt-Matthiesen et al 2005

Extragenital changes:

Apart from the specific genital changes, during puerperium it comes to changes in the whole organism. Circulation and blood composition normalise and oedemas resolve.

The action of the intestines and the bladder function may be changed. By delivery, conditions in the abdominal cavity change drastically. Therefore, the regular action of the intestines is diminished in the first puerperal days.

It takes one or two weeks until the intestines find back to their primordial position and defaecation frequency. Bladder function and micturition can be disturbed, too. By the additional excretion of deposited tissue fluid, urine production is increased, leading to large floods of urine.

Mechanical changes of the pelvic floor - by tears, episiotomy and injuries by pressure - and swelling of the urethra and of the neck of the urinary bladder as consequences of delivery, can lead to a changed micturition.

Mechanical as well as hormonal changes in the connective tissue (rectus diastasis, stretch marks, skin pigmentation) recover again.⁵⁴

⁵⁴ Harder 2005

6. Actual Level of the Care in Puerperium at the Kufstein Hospital

6.1. Location of the Study

The performance of this study was enabled in the department of gynaecology and obstetrics at the Bezirkskrankenhaus Kufstein (district hospital Kufstein).

The Bezirkskrankenhaus Kufstein is a 376-bed public hospital, which is upheld by the surrounding municipalities. It comprises all medical disciplines of a district hospital inclusive a department of neurology and psychiatry.

The department of gynaecology and obstetrics comprises a gynaecological ward (12 beds), a puerperal ward (20 beds) and the labour ward that consists of four labour rooms and one room with a bath tub. Therefore, the women have the opportunity to decide on a water birth.

In 2007, altogether 745 babies were born at the Bezirkskrankenhaus Kufstein. 197 babies were delivered by caesarean section; the others were delivered vaginally. Operative interventions were necessary in 54 cases (vacuum, forceps extractions).

6.2. The In-Patient Attendance during Puerperium at the Kufstein Hospital⁵⁵

The postnatal ward comprises 20 beds, whereby four are situated in two-bed rooms and the others in four-bed rooms. One midwife and 10.25 registered nurses are occupied at this ward.

Seven medical specialists and junior doctors in gynaecology and obstetrics as well as one trainee doctor are responsible for physician's care in the whole gynaecological department. The paediatrists of the paediatric ward are responsible for the daily paediatric ward round.

⁵⁵ Bachmair 2008

Ahead of delivery, the pregnant women have the opportunity to become acquainted with the obstetrics ward at the hospital within an information evening (“stork evening”, “Storchenabend”, translated by Woisetschläger) and the current prenatal classes. On these occasions, they also have the opportunity to visit the labour- and the postnatal ward.

The admission to delivery happens without additional pre-registration. Only for planned caesarean sections appointments have to be made. The average residence time of the puerperal women after vaginal deliveries is three to four days and after delivery by caesarean section five to six days.

The regular care during puerperium happens according to Dorothea Orem’s self care model and the rooming-in model. The mothers are coerced to take over nursing of their baby immediately after birth. Nurses and midwives inform the mothers about all important facts of nursing (cf. Fig. 1).

Information meeting

Patient label:

Department: Postnatal ward

Date /Initials	Date /Initials	Date/Initials
<p>Breast-feeding yes no</p> <p>Medical history:</p> <p>° Attaching: Correct attaching Frequency Duration Breast-feeding position</p> <p>° Signs of hunger ° Sustenance of mamilla ° Bra!? ° Breast engorgement ° Breast massage ° Nutrition during lactation period (Smoking) ° Hand hygiene (intimate care)</p> <p>Ablactation: ° Drugs, teas ° Signs of hunger ° Frequency ° Preparation of bottle food and cleaning ° Labels on bottle food</p>	<p>Breast-feeding positions:</p> <p>Lying position- shown on: [Date]</p> <p>Cradle hold – shown on: [Date]</p> <p>Dorsal grip- shown on: [Date]</p> <p>Nappy change –shown on: [Date]</p> <p>Umbilical cord care- shown on: [Date]</p> <p>Bathing – shown on: [Date]</p>	<p>Information about:</p> <p>° Routine examinations (baby, mother)</p> <p>° Bathing hours</p> <p>° Soother</p> <p>° Rooming-in</p> <p>° Nursing room</p> <p>° Postpartum gymnastics</p> <p>° Clothes disposal</p> <p>On demand:</p> <p>° Thromboprophylactic stockings</p> <p>° Baby sling</p> <p>° Pumps</p> <p>° Nipple shields</p>

Fig. 1: Checklist for the information meeting for puerperal women at the postnatal ward at the Bezirkskrankenhaus (district hospital) Kufstein.

Registered nurses with special education in lactation consulting support the mothers and newborns in breast-feeding.

If desired, apart from standard care, the paediatric nurses also offer baby massage and an introduction into kinaesthetics for babies.

6.3. Delivery Assistance and Puerperal Care by the Midwife at the Kufstein Hospital⁵⁶

Altogether 12 midwives (equivalent to 7.3 full-time jobs) work on a regular circle in the labour ward of the Bezirkskrankenhaus Kufstein. In this way, the labour ward is in charge of a midwife around the clock. Additionally, one colleague is on standby.

Ninety-eight percent of the deliveries take place in the birthing bed. Nevertheless, the supine position is largely being avoided and the midwives guide the parturients to take up a lateral position or to be on all fours, in order to attain an optimal delivery position. The beds can be turned in that way, that the parturient can deliver in sitting position, too.

Apart from standard assistance, the midwives offer acupuncture for facilitation of delivery during the single phases of delivery. Alternatively, homeopathic globules and aromatic oils are applied.

Straight after delivery - provided that mother and baby are doing well - the newborn is placed on the breast of the mother and the father cuts the umbilical cord. According to their requirements, mother and baby stay in this position for up to two hours to grant optimal „bonding“. Depending on the infant's reactions, breast-feeding is tried.

After delivery by caesarean section, the father takes over the “bonding”.

After the bonding phase, mother and baby leave the labour ward and they are transferred to the postnatal ward, where the further care is taken over by perinatal nurses.

At the first postpartum day, the midwife in charge contacts the puerpera and the infant again. They talk about the delivery and the midwife answers potential questions.

⁵⁶ Manzl 2008

Apart from delivery assistance, the midwives offer prenatal classes in the third pregnancy trimenon. At the Bezirkskrankenhaus Kufstein, two women's classes per week (only for expectant mothers) and a pair class (for both parents) are held.

7. Methodology

7.1. Type of the Study

It is the aim of this study to investigate, whether osteopathic treatment administered additionally to the standard in-patient care in puerperium has an influence on the emotional state of puerperal women.

The selection of the study design was difficult. Since the problem called for a clinical experiment, the genuine experimental design with randomised group assignment would be the gold standard.

Since this study had to be finished within approximately ten months, too few appropriate subjects were available for granting a correct randomisation.

Therefore, this study was set up as clinical study with quasi-experimental design and match controlled group assignment.

Twenty puerperal women should be treated osteopathically once within the first three days after delivery in addition to standard in-patient care in puerperium.

Twenty puerperal women, who should not receive an osteopathic treatment in addition to standard in-patient care in puerperium, should serve as control group.

At group assignment of the women to the experimental and control group, respectively, an essential problem arose. In consideration of the fixed schedule and the dependency on the actual number of puerperal women at the postnatal ward of the Kufstein hospital, subjects could not be randomly assigned to the two groups.

Thus, I decided to split the study in two parts and to assign the puerperal women who meet the inclusion criteria on basis of the particular date of delivery. Therefore for matching the two groups it was crucial, that the women fulfilled the inclusion criteria as closely as possible. Inclusion- and exclusion criteria were predefined under consideration of the factors responsible for the genesis of maternity blues.

In the first part of the study, twenty puerperal women, meeting the inclusion criteria, were treated osteopathically. That means, they were assigned to the experimental group. In the

second part of the study, another twenty women, who delivered after finalisation of the treatments in the experimental group, were assigned to the control group. All participants were assigned in strict sequence of their delivery.

Since it had to be assumed, that the subjects would talk to each other at the maternity ward, the aspect of envy („My roommate was treated, but I was not...”) was circumvented by this temporal separation.

All mothers received the same empathy during the in-patient care in puerperium and did not know what group they belonged to (the controls were treated after finalisation of the surveys). Therefore, basically, all participants had the same expectations with regard to the study.

Since it is the aim to investigate potential influences on dysphoric disorders after delivery, the *Edinburgh Postnatal Depression Scale (EPDS)* was used as screening instrument. This scale exclusively measures the emotional state.

I will introduce the *Edinburgh Postnatal Depression Scale (EPDS)* in the next chapter.

7.2. The Edinburgh Postnatal Depression Scale (EPDS)

The Edinburgh Postnatal Depression Scale was used for measuring the emotional state of the puerperal women after delivery.

The validated Edinburgh Postnatal Depression Scale (EPDS, cf. Appendix 1) was designed by Cox et al. (1987) and is the worldwide best known and mostly used questionnaire for assessing emotional states and depressive disorders of puerperal women.

The questionnaire helps to recognise women who are at an increased risk of postnatal depression. The EPDS has a well-documented validity in different languages (Alfonso et al., 2000). The German version „Befindlichkeitsbogen“ was developed by Herz et al. (1996) and revised by Muzik et al. (1997).^{57/58/59}

The EPDS is a self-assessment test, comprising ten questions about the mental state that are interrogated with a four-point scale. By this test, data about the following symptoms are collected:

- o Joy
- o Self-accusation
- o Anxiety
- o Unrest
- o Ability to cope
- o Sleep disorders
- o Sadness
- o Tendency to weep
- o Risk-to-self

The four response options with scores from null to three comply with the severity of the symptoms.

The evaluation is done by adding up the scores of the single response options. Therefore, the total score lies between 0-30 points.

⁵⁷ quoted according to Ahrer 2006

⁵⁸ Marcé-Society 2008

⁵⁹ Beyondblue 2008

- 0-9 low probability for developing a depression
- 10-12 moderate probability for developing a depression
- 13-30 high probability for developing a depression

The EPDS proves itself valuable, because it is well accepted by the women and easy to answer.

In the case of this actual study dealing with the potential influence of osteopathic treatment on the emotional state of mothers in early puerperium, the EPDS does not only serve the evaluation of the probability of a depression, but in this case, it is used as screening instrument that gives information about the general emotional state of the mother. The lower the total score, the less likely is a postnatal dysphoria (maternity blues).

7.3. Sampling of Participants

Pregnant women were informed about the study by means of an informative sheet (cf. Appendix 2) that was handed over by midwives and nursing staff of the gynaecological and obstetric department of the Bezirkskrankenhaus Kufstein during the prenatal classes. Women, who did not take part in a prenatal class and who came directly to Hospital to deliver, were informed on the first postpartum day.

Women, who were willing to participate, were asked to answer the questions in the informative sheet and to return the sheet to the midwives or nurses.

The participation in the study was tied to the fulfilling of the criteria summarised below.

Inclusion- and exclusion criteria were predefined under consideration of the multifactorial causes for the development of maternity blues (cf. chapter 3.2).

Inclusion criteria:

- Spontaneous delivery without elevated delivery stress (no operative deliveries*)
- Healthy baby
- Healthy mother
- Knowledge of the spoken and written German language

Exclusion criteria:

- Delivery by caesarean section
- Operative deliveries*
- Stillbirth
- Pre-existing mental lability of the mother**
- Medical problems during pregnancy**
- General burdening events during pregnancy**
- Medical problems of mother after delivery ***
- Medical problems of infant after delivery ***

* Delivery of a baby with involvement of vacuum, forceps, PDA

**Surveyed with questionnaire during prenatal class (cf. Appendix 2)

***Surveyed by delivery assistant - midwife/ physician

7.4. Course of the Study

7.4.1. Contacting the Participants

On the first day after delivery, the nurse of the postnatal ward consulted the concerned midwife/doctor about the postnatal physical condition of mother and infant (cf. exclusion criteria). Then (if participation still was desired by the mother), she established contact with the puerperal women who had registered for participation in the study and who had „qualified“ before.

Each mother was being informed about the study in the morning of the day of treatment for a second time and each participant signed a statement of agreement (cf. Appendix 3).

7.4.2. Treatment

7.4.2.1. Experimental Group

In the first phase of the study, twenty puerperal women receiving standard in-patient care at the Kufstein hospital were treated according to the rules of osteopathic methodology within the first three days after delivery. Treatment lasted 45 minutes on average and comprised a complete osteopathic appraisal and treatment. Relevant data for therapy and study were collected by means of a questionnaire (cf. Appendix 4)

Subsequent to therapy, the puerperal women received the EPDS sheet inclusive a franked envelope. They were asked to answer the questions on the tenth day postpartum and then to return the completed sheet.

In order to ensure, that the questionnaire was completed and sent back, I reminded the participants by telephone on the tenth postpartum day.

7.4.2.2. Control Group

After finalisation of the treatments in the experimental group, I established contact with those puerperal women, who should represent the control group. Again, the women were assigned to the control group strictly in the order of their real date of delivery.

Then, the twenty puerperal women of the control group were informed about the study. They received the standard in-patient puerperal care, but no additional osteopathic treatment. The osteopathic treatment they did receive after finalisation of the study was not object of the study any more. It took place in my own practice outside the hospital.

After signing the statement of agreement, the puerperal women received the EPDS sheet with a franked envelope and I asked them to complete it on the tenth postpartum day and then to return it. To be sure, that the questionnaires really were answered and sent back, I reminded the participants by telephone on the tenth day after delivery.

This phase of the study lasted 15 weeks, since it depended on the number of women who had delivered and who additionally were willing to take part in the study.

8. Statistical Evaluation and Results

Altogether 40 puerperal women took part in the study. The response rate of the questionnaires was 95%. Thirty-eight women sent back the questionnaire on schedule (one subject of either group did not return the questionnaire).

Data were evaluated by a statistician.

8.1. Statistical Evaluation

Data of the single EPDS statements are ordinal and almost all of them deviate distinctly from normal distribution. The only exception is the totalled overall score of all ten questions that is normally distributed. Therefore, non-parametric tests were used for the group comparisons of the distributions of the scores of the individual questions and for the group comparison of the frequency of primiparous women.

In special, these were χ^2 -tests and Mann-Whitney u-tests.

χ^2 -tests were used to test whether primiparous women are equally distributed in both groups, and Mann-Whitney u-tests to compare the score distributions of the ten single EPDS questions of both groups.

Independent samples t-tests were used for significance testing of group differences of the mean age and of the mean total scores of the EPDS in the both groups, only.

Additionally, in advance of these calculations, tests for normal distribution (Kolmogorov Smirnov test) and for homogeneity of variance (Levine's test) were performed.

Software used was SPSS® 14.0.. Tests were performed two-tailed and p-values $p < 0.05$ were considered statistically significant.

8.2. Results

In this chapter, first of all, group characteristics (age of the women, number of primiparous women) will be compared and afterwards, the relevant outcomes of the EPDS will be presented. The raw data of the survey are summarised in Appendix 5. Since the statistician was blinded, the designation “group a” will be used for the test group and “group b” for the control group in the figures of the following chapter.

8.2.1. Group Characteristics (Age/Number of Primiparous Women)

In order to evaluate a possible relationship of maternity blues with age of the mother and parity (primiparity and multiparity), data concerning these issues had been collected in advance of the delivery. As described in chapter 3, it is not for certain, that there is such a relationship between maternity blues and these two factors. In case, that the two groups would differ too much in these variables, I intended to have this considered in the statistical evaluation.

Both groups comprise 19 women, who recently have delivered. According to the results of a χ^2 -test, they do not differ significantly in the relative number of primiparous women ($\chi^2=1.052$, $p=0.31$, cf. Table 2).

Group	Test group		Control group	
	N	%	N	%
Primiparous				
No	14	737	11	579
Yes	5	263	8	421
Total	19	1000	19	1000

Table 2: Relative frequencies of primiparous women in the two groups.

Groups do not differ significantly in the mean age of the women (test group: 32.4 (5.1) years, control group: 30.1 (3.2) years). An independent samples t-test with the dependent variable “age” and the independent variable “group” results in $t=1.678$ and $p=0.10$.

The age structure of the two groups can be observed in Fig. 2.

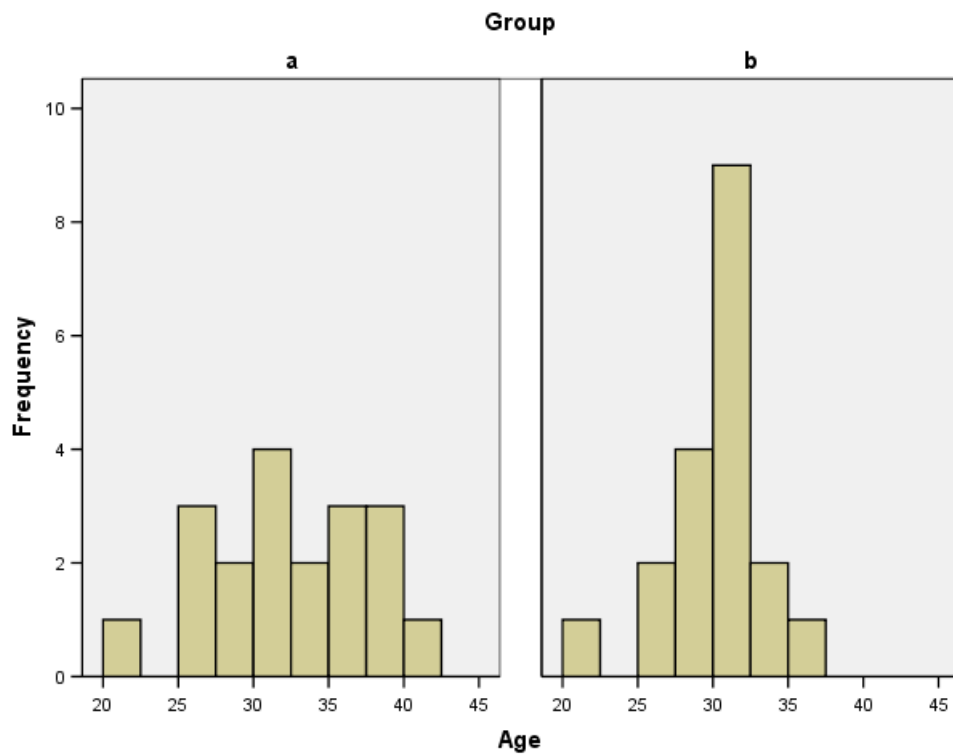


Fig. 2: Age structure of the two groups (“group a”: test group, “group b”: control group).

As can be observed in Fig. 2, there are more older mothers in the test group than in the control group. Nevertheless, as described above, groups do not differ significantly in age. That means, age and parity do not influence the results of this study, since characteristics of both groups are similar.

8.2.2. Results of the Edinburgh Postnatal Depression Scale

Group differences in the distribution of the response categories of the individual ten questions of the EPDS are summarised in Table 3 by means of the results of Mann-Whitney tests. Additionally, mean values of the scores are contrasted for the two groups.

Question	Mann-Whitney u-test			Means	
	u	Z	p	Test group	Control group
Q1: I have been able to laugh and see the funny side of things.	1405	-1442	15	21	47
Q2: I have looked forward with enjoyment to things.	1750	-238	81	21	32
Q3: I have blamed myself unnecessarily when things went wrong.	1450	-1118	26	68	105
Q4: I have been anxious or worried for no good reason.	1490	-985	32	116	137
Q5: I have felt scared or panicky for no very good reason.	1265	-1778	8	42	79
Q6: Things have been getting on top of me.	1495	-1060	29	74	95
Q7: I have been so unhappy that I have had difficulty sleeping.	1695	-477	63	16	26
Q8: I have felt sad or miserable.	1710	-331	74	47	58
Q9: I have been so unhappy that I have been crying.	1755	-169	87	47	47
Q10: The thought of harming myself has occurred to me.	1805	0	100	0	0

Table 3: Results of the Mann-Whitney u-tests and mean scores of the ten individual statements of the EPDS questionnaire.

Average scores are higher in the control group for eight of the ten statements, in one case the same score can be observed in both groups and in neither group any of the women thought of harming herself.

Results of the Mann-Whitney tests show, that responses in the two groups do not differ significantly for any statement.

A single distinct difference can be observed in question Q5 ($p=0.08$). The distribution of the responses for this statement can be observed in Fig. 3, the distributions of the other statements are summarised in Appendix 6.

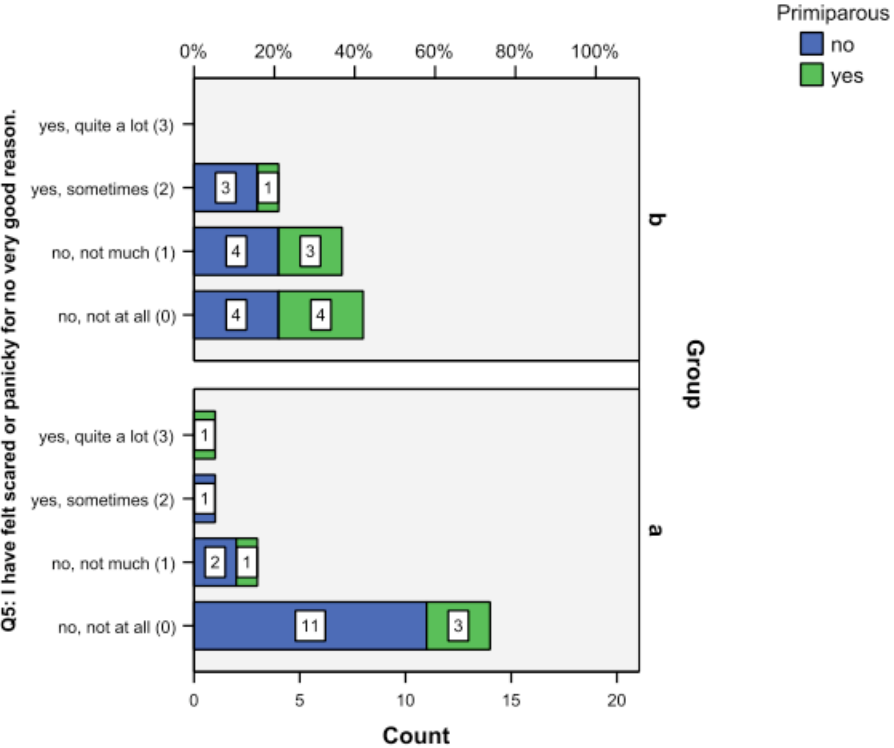


Fig. 3: Responses for statement Q5 (“I have felt scared or panicky for no very good reason.”) of the EPDS in the two groups (Group “a”...test group, group “b”...control group).

As can be observed in Fig. 3, fewer members of the test group (group “a”) have felt scared or panicky than members of the control group (group “b”).

The significance test of the total score of all ten questions (“total (Q1:Q10)”) as dependent variable with the independent variable “group” results in $p=0.26$. That means, mean total scores of the two groups do not differ significantly. Group means, standard deviations and results of this independent samples t-test are summarised in Table 4.

Variable	Group	N	Mean	Std. Deviation	t	p
total (Q1:Q10)	Test	19	45	38	1153	26
	Control	19	63	54		

Table 4: Results of the independent samples t-test of the total score and the independent variable “group”.

Finally, independent samples t-tests were used for an assessment, whether primiparous women differ in EPDS total score from multipara. Group means, standard deviations as well as the results of the significance tests are shown in Table 5.

Variable	Group	Primiparous	N	Mean	Std. Deviation	t	p
total (Q1:Q10)	Test	no	14	429	387	451	66
		yes	5	520	396		
	Control	no	11	736	664	1195	25
		yes	8	475	249		

Table 5: Results of independent samples t-tests of the total scores in both groups with the independent variable “primiparous”

Mean total scores of primiparous women and multipara do not differ significantly in any of the two groups. Additionally, it is obvious, that there is no systematic influence of primiparity on the EPDS total score, since primipara score higher in the test group, but lower in the control group.

8.3. Summary of the Results

Groups are comparable with regard to age and the relative number of primipara.

No significant differences between the two groups can be observed with regard to the EPDS total score and the single statements of the EPDS.

According to the actual data, risk for depressive diseases is lower in the test group than in the control group.

9. Discussion

The two groups do not differ significantly in the EPDS total score ($p=0.26$). That means, according to these data, there is no significant influence of osteopathic treatment on maternity blues. In the actual study, mean total scores are 4.5 (SD: 3.8) in the study group and 6.3 (SD: 5.4) in the control group.

Under consideration of the single questions of the EPDS, there is only one, where distinct group differences could be found: Women, treated osteopathically have felt less often scared or panicky for no very good reason than the controls (EPDS-statement 5, $p=0.08$).

Nevertheless, this group difference is statistically insignificant, too.

According to Bergant et al (1998), prevalence of postnatal depressive disorder is 20% (using a cut-off of over 9 of the EPDS total score for possible depressive disorder). In the actual study, there are three women (15.8%) with a total score >9 in the treatment group, and four women (21.1%) in the control group. That means, that the prevalence of possible postnatal depressive disorder in the control group is rather consistent with these literature data, whereas the prevalence of possible postnatal disorder is (slightly and possibly due to chance) lower in the treatment group.

Nevertheless, these results must be interpreted cautiously, due to some methodological restrictions.

The most severe one is the small sample size (19 women per group). The influence of chance is higher in small samples, which can either lead to a reduced significance or an overvaluation of group differences.

Furthermore is questionable, whether that particular sample characterises the population of women, who have just given birth. According to Woisetschläger⁶⁰, at least 84 subjects would be necessary for each group to statistically verify the observed group difference of 1.8 points (test performed one-tailed, $\alpha = 0.05$, power = 0.8).

⁶⁰ Woisetschläger, 2008

The lack of a placebo treatment of the controls is another methodological restriction. The psychical condition of women, who have given birth recently, might be influenced positively by any care beyond the scope of standard care.

To ascertain, that osteopathic treatment really causes an improvement in the EPDS total score, a placebo treatment of the control group subjects would be necessary in further investigations.

However, there is no hint, that the results of this study are influenced by this fact, since there is no significant improvement in the test group compared to the control group.

Furthermore, this restriction can be attenuated, because all women of the control group have been informed in advance, that they would receive an osteopathic treatment after the completion of the questionnaire, and thus they would receive additional care. Additionally, the participants were not informed, what group they belonged to. Therefore, the only difference in care of the puerperal women was the time of treatment. However, in a scientific sense, this procedure does not fully compensate the lack of blinding, since some women have already been treated and the other expected to be treated, when they filled the questionnaire.

The circumstance that general as well as individual external influences during puerperium could affect the momentary mood of a puerperal women claims a critical interpretation of the results, too.

Seasonal influences could be precluded, since all women delivered in the same season (in early summer). However, individual influences, such as the care they received by their family and friends during the puerperal period, could not be assessed.

These factors indeed could influence the momentary mood of a puerpera. Short term influences, such as a crowded maternity ward with little space and time for care of the particular puerpera, likeable/less likeable room mates, nurses or midwives could not be precluded, because these differences depended on the date of delivery.

During the course of this study, I had to notice, that momentary mood is dependent on multifactorial influences. It was not possible to design as neutral initial conditions as would be necessary for more objective results. Again, a higher sample would have alleviated this problem.

Finally, I want to moot, how far this study could assess the subject of interest.

The maternity blues is considered as physiological transitory syndrome of early puerperium. However, it is rated as a predictor for subsequent postnatal depression (cf. chapter 3).⁶¹ Therefore, it would be interesting to assess the mood of the mother up to the infant's first birthday. This is the period, when a depression in the sense of the International Classification of Diseases (ICD 10)⁶² can develop. It would be suggestive to survey the mood of the women of both groups by means of the EPDS after six month as well as after one year and to compare the results of all three surveys (tenth day postpartum, six month and one year postpartum).

If mothers, who were treated osteopathically, would score better than the subjects of the control group in all surveys, there would be evidence that women benefit from postnatal osteopathic treatment.

However, a by far larger sample would be necessary. Additionally, exterior influences would have a higher impact on the results, what would have to be considered in strict inclusion criteria (stratification by other factors, such as family status, support by husband, health of the infant, material problems, ...).

Thus, this study can be rated as a first step for an evaluation of a possible influence of osteopathy on the postnatal emotional state of mothers, only.

Generally, I want to mention particularly, that during my study I had the possibility to work closely with the staff of the puerperal ward (doctors, midwives and nurses) of the Bezirkskrankenhaus (district hospital) Kufstein bringing about a higher awareness of osteopathy.

⁶¹ Beck 2001, Fabjan 2004, Bergant 2005

⁶² Dilling et al.

Now, at the Bezirkskrankenhaus Kufstein, osteopathy is well accepted as serious, complementary therapy and the standardised integration of osteopathic treatment in puerperal care is already being planned.

10. Summary

The hypothesis of this study was, that an osteopathic treatment administered within the first three days postpartum in addition to the regular care during puerperium improves the emotional state of puerperal women in early puerperium.

Method and literature research

Due to the underlying circumstances, I decided on a quasi-experimental design with match controlled group assignment for this clinical experiment. My sources of information were Medline (Pubmed), COCHRANE, the university library Innsbruck, periodicals, secondary references and consulted experts. I received the necessary data and information by entering the keywords “postpartal/-natal dysphoria”, “maternity blues”, “postpartal/-natal depression”, “delivery”, “puerperium”, “childbed”, “Edinburgh Postnatal Depression Scale”, “EPDS”.

Procedure of the study

The study was performed at the postnatal ward of the Bezirkskrankenhaus (district hospital) Kufstein, in co-operation with the doctors, midwives and nurses in charge.

Altogether 40 women took part in this study and 19 valid questionnaires per group could be finally evaluated.

20 puerperal women were treated osteopathically once within the first three days after delivery. Subsequently their emotional state of the last ten days was surveyed at the tenth day postpartum by means of a standardised questionnaire. 20 other puerperal women acted as controls. They did not receive osteopathic treatment but the same standard care during puerperium. The emotional state of the controls was also surveyed at the tenth day postpartum with the same questionnaire.

The questionnaire used was the worldwide validated questionnaire for the emotional state of puerperal women, the „Edinburgh Postnatal Depression Scale“ (EPDS).

Results of the study

After statistical evaluation of all 38 questionnaires, it became apparent, that experimental group and control group did not differ significantly in the EPDS total score ($p=0.26$). Referring to this result, it has to be said, that a single osteopathic treatment has no influence on the emotional state of puerparal women in early puerperium, and thus the hypothesis of my study could not be confirmed.

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Appendices

- 1 Edinburgh Postnatal Depression Scale (German version)
- 2 Informative Sheet
- 3 Statement of Agreement
- 4 Examination- and Treatment Sheet
- 5 Raw Data of the EPDS Survey
- 6 Graphical Illustration of the Results (Single EPDS Statements)