



## City Research Online

### City, University of London Institutional Repository

---

**Citation:** Brennan, A., Ayers, S., Ahmed, H. & Marshall-Lucette, S. (2007). A critical review of the Couvade syndrome: The pregnant male. *Journal of Reproductive and Infant Psychology*, 25(3), pp. 173-189. doi: 10.1080/02646830701467207

This is the unspecified version of the paper.

This version of the publication may differ from the final published version.

---

**Permanent repository link:** <https://openaccess.city.ac.uk/id/eprint/2005/>

**Link to published version:** <https://doi.org/10.1080/02646830701467207>

**Copyright:** City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

**Reuse:** Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

---

---

---

City Research Online:

<http://openaccess.city.ac.uk/>

[publications@city.ac.uk](mailto:publications@city.ac.uk)

---

**A CRITICAL REVIEW OF THE COUVADE SYNDROME:  
THE PREGNANT MALE**

A. Brennan, S. Ayers, H. Ahmed & S. Marshall-Lucette

**Please cite this paper as:**

Brennan, A., Ayers, S., Ahmed, H., & Marshall-Lucette, S. (2007). A critical review of the Couvade syndrome: The pregnant male. *Journal of Reproductive and Infant Psychology*, 25(3), 173-189.

## **Abstract**

The Couvade syndrome is a global phenomenon occurring in industrialised countries around the world and has a wide international variance. It affects biological fathers particularly during the first and third trimesters of pregnancy with cessation of symptoms after birth. It does not appear in the nosology of the Diagnostic Statistical Manual of Mental Disorders: DSM-Version 4, (American Psychiatric Association 2000). Nevertheless, early accounts tended to medicalise it as a psychosomatic disorder. Its relationship with socio-demographic factors is inconsistent, with the exception of ethnicity. International studies reveal some contradictory findings in the type of symptoms. This may reflect methodological problems in the syndrome's definition or criteria and type of measurement across studies. A plethora of theories has been put forward to account for the origins of the syndrome. Psychoanalytical theories contend that it is a consequence of the man's envy of the woman's procreative ability or foetal rivalry. Psychosocial theories propose that it occurs due to the marginalisation of fatherhood and as part of a transitional crisis to parenthood. Paternal theories suggest a connection between the man's involvement in pregnancy, role preparation and the syndrome. However, some of these theories have not been thoroughly investigated. Those which have reveal inconsistent findings. It is recommended that future investigators use qualitative approaches to further illuminate the syndrome's characteristics, definition and perceptions as seen by male partners. This should be followed by quantitative approaches of large heterogeneous samples to assess the relationship of socio-demographic factors and the syndrome.

**Key Words:** Couvade Syndrome, Modern Couvade, Sympathetic pregnancy, Pseudo-pregnancy, Pseudocyesis

## **Introduction**

It is often assumed that the physical and psychological effects of pregnancy are only experienced by women, a concept that is reflected in the bulk of literature addressing this theme. However, pregnancy also affects male partners in ways that relate to their physiological and psychological constitution, a concept of potential importance in reproductive analyses. This paper reviews the literature on psycho-physiological symptoms experienced by men during the period of their partner's gestation, collectively known as the Couvade syndrome. In the UK, it appears that the syndrome arouses little interest and men who display its symptoms are usually ignored, ridiculed or remain undiagnosed. There is also lack of clarity in the ways in which the syndrome is defined. Therefore, the reported international incidence, socio-demographic characteristics, physical and psychological symptoms and their time course over pregnancy and postpartum period, as well as the clinical implications of the studies are all discussed. The theoretical approaches attempting to explain the syndrome origins are then explored. Finally, some suggested directions for future research in the area are proposed within the conclusion.

## **Definitions of the Couvade Syndrome**

There are a number of definitions of the syndrome proposed in the literature, some of which are medical while others focus on the problems associated with the syndrome's diagnosis. The term "Couvade" was first introduced into the anthropological literature by Tylor (1865), and is derived from the French verb "*Couver*", which means to brood, nest or hatch. The syndrome is an involuntary, unconsciously determined phenomenon occurring in industrialised societies across the world. It receives no acknowledgement either in the Diagnostic Statistical Manual of Mental Disorders:

DSM-Version 4, (American Psychiatric Association, 2000) or the International Classification of Diseases: ICD-Version 10, (World Health Organisation, 1993). This suggests that the syndrome is neither a physical nor a mental disorder but rather a natural manifestation related to pregnancy. However, the syndrome is mentioned in the *Dictionary of Medical Syndromes* (Magalini and Magalini, 1997), where it is proposed as a neurotic disorder which occurs in men whose partners are pregnant, usually within the first and third trimesters of pregnancy. Trethowan and Conlon (1965) defined it as “a state of physical symptoms of psychogenic origin which occurred in the partners of pregnant women”. The symptoms are chronologically connected to the pregnancy with their cessation at the birth of the child or shortly within the postpartum period. These definitions imply that the syndrome is a psychosomatic manifestation triggered by pregnancy. Clinton (1987) proposed that the syndrome consists of a wide array of physical and psychological symptoms experienced by men during their partners’ pregnancies in industrialised countries worldwide. Klein (1991) argued that it is a poorly understood phenomenon with no clear physiological basis, where the partners of pregnant women experience somatic symptoms during the period of gestation. Similarly, Schodt (1989) and Mason and Elwood (1995) conclude that the syndrome is not explained by illness or injury and that its diagnosis, if any, is made principally by exclusion. Couvade symptoms are, by definition, non-specific and transient which hamper attempts to discriminate them from symptoms which do have a physiological basis. Therefore, one could summarise the presumptive definition of the Couvade syndrome as a psychosomatic phenomenon with little or no recognised physiological basis that affects male partners mainly during the first and third trimesters of gestation and disappears early in the post partum period.

## **Search Strategy**

A number of key words were used to guide the search. These were “*Couvade*”, “*Couvade Syndrome*”, “*Modern Couvade*”, “*Sympathetic Pregnancy*”, “*Pseudo-pregnancy*” and “*Pseudocyesis*”. Search databases included Ovid Online, PubMed, Cinahl, Assia, British Nursing Index, Midirs and PsychInfo. The search covered the period 1950-2006 to obtain relevant archival and contemporary literature. It was expanded to include international sources given the syndrome’s global nature. Midirs, Cinahl and PsychInfo were among the more prolific databases with the most contemporary articles relating to the 1980’s and 90’s. Unfortunately, a few relevant articles were published between 2001-2006 compared to the 80s and 90s. This phenomenon, of fluctuating interest over decades, is seen with other subjects that do not receive a lot of scientific interest and the financial support of established independent and public funding bodies. In addition, diminishing interest might be due to a tendency to minimise the adjustments of normally healthy males to pregnancy.

## **Incidence**

The international incidence of the syndrome is highly varied and this is demonstrated in a number of studies which make reference to its epidemiology. The syndrome’s incidence in the U.K. is largely unknown, but the range of early reported estimates varies between 11% and 50% (Trethowan and Conlon 1965; Dickens and Trethowan, 1971). In Sweden, Bogren (1984) found an incidence of 20%, while in the USA, Fawcett and York (1986) reported a varied incidence of 25% to 52%. However, higher incidence rates (up to 97%) were also reported in the USA by Clinton (1985, 1986) and Brown (1988). The global nature of the variability of the incidence is further documented by reports from Thailand by Khanobdee ‘*et al.*’ (1993) who

estimated an incidence of 61%. A similar incidence of 68% among Chinese men was reported by Tsai and Chen (1997). Marilov (1997) reported an incidence of 35% in Russia. However, the syndrome has rarely been reported in Australia (Condon, 1987), which may reflect reluctance by male partners to report such symptoms, a lack of interest from healthcare professionals or problems with diagnostic accuracy. In addition, reporting these symptoms might be considered as an anathema in what some people claim to be a “Macho” culture. Thomas and Upton (2000) endorse this view when they state...“Many men hide the physical symptoms of the syndrome as they may be ashamed to admit them lest this indicates weakness”. Therefore, the incidence of the syndrome shows a global variability with an overall range of 11-97% which is a significant proportion of all pregnancies. This provides a good rationale for further investigating the explanatory factors that might account for such variance across countries in particular patterns of healthcare consultation and referral as well as socio-demographic characteristics.

### **Socio-demographic factors**

Many of the reports on the relationship between socio-demographic factors and the Couvade syndrome are contradictory. This is particularly evident in those examining its relationship with age, education and social class. Brown (1983) confirmed a greater occurrence of the syndrome in men younger than 30 years old, while Bogren (1989) found that the syndrome was more common among men over 30 years old who were more highly educated and of a higher social class. Strickland (1987) reported that working class men experienced a significantly higher number of somatic and psychological symptoms compared to those who were middle class. Munroe and Munroe (1971, 1973); Trethowan in Howells (1972); Munroe (1980); Lipkin and

Lamb, (1982) all indicate a greater prevalence of the syndrome among those with lower education compared with Bogren's (1989) results. Clinton (1986) totally refutes the findings of previous studies identifying age and educational level as correlates of the syndrome. These reported differences in socio-demographic factors are difficult to explain, but factors like different sample sizes, study methodologies, ethnic variability, different times of conducting the study and stage of pregnancy during which the investigations were performed might explain some of these differences. Studies of larger numbers of male partners of different age, social class, level of education and ethnic groups are needed in order to determine the reasons for these.

The syndrome is not solely confined to first-time expectant men but also affects those with previous children. However, the findings are again inconsistent. Trethowan and Conlon (1965) found no significant differences in the incidence of the syndrome between men expecting their first child and those who already had children. The investigators concluded that first-time expectant men were no more susceptible than those with children. However, Clinton (1986); Condon (1987); Ferketich and Mercer, (1989) collectively demonstrated statistically significant positive correlations between occurrence of the syndrome and the number of previous children. The stage of pregnancy might be important, as a later study by Sizaret 'et al' (1991) found that during the first trimester of pregnancy a higher proportion of primiparous men had Couvade symptoms compared to those who were multiparous.

The incidence of the syndrome in relation to pregnancy planning has also been investigated. Clinton (1985, 1986) and Strickland (1987) confirmed a higher incidence of the syndrome among those where the pregnancy was unwanted or

unplanned. May (1980) used a grounded theory approach to explore the attitudes and behaviours of 20 first-time expectant men toward pregnancy. The investigator concluded that the acceptance of pregnancy by the man was a predisposing factor for the Couvade syndrome. However, Bogren (1983, 1984) disputed these findings by concluding that acceptance or non-acceptance of the pregnancy had no impact on susceptibility to the syndrome.

Ethnicity is the one demographic factor whose relationship with the syndrome appears to be consistent. Anthropological studies of three societies by Munroe and Munroe (1971, 1973) found that Black Caribbean males reported greater number and frequency of symptoms of the syndrome compared to a Caucasian American sample. Similarly Davis (1978) and Clinton (1986) also confirmed a higher incidence of the syndrome among ethnic minorities and black men in the United States.

### **Symptoms and Time Course**

Over the last four decades international studies have sought to investigate the type, frequency and time course of Couvade syndrome symptoms. These have included physical and/or psychological symptoms and their patterns of duration and cessation over pregnancy. In the UK, Trethowan and Conlon (1965) investigated the frequency, incidence and duration of the symptoms of the syndrome over the nine months of pregnancy in 327 men (mean age 29) whose partners were pregnant compared with 221 married men (mean age 35) whose partners were not. Fifty-eight percent of expectant men had no previous children compared to only 14% of the control group. Both groups were matched for social class. The data collection consisted of a questionnaire of 9 physical and 9 psychological symptoms of the syndrome reported

in the literature. One hundred and eighty-six expectant men (57%) exhibited more than 2 symptoms over the nine months of gestation as opposed to 101 (46%) in the comparative group. The most common symptoms were loss of appetite, toothache, nausea, sickness and anxiety. Peak incidence of symptoms occurred in the third month of pregnancy. They tended to diminish in the second trimester and rise again during the ninth month. Thirty percent of expectant men indicated a cessation of symptoms just before labour began, 36% immediately after birth, while 23% indicated their persistence into the postpartum period. There was a statistically significant association between the occurrence of each of the physical and psychological symptoms. The latter included depression, anxiety, insomnia, irritability and nervousness. The small difference in mean age between the groups (29 vs 35 years) might represent a confounding factor with some impact on the results as is the differing parity between the groups. The investigators have not appropriately addressed this aspect. The authors might have looked at the age difference as an additional factor in the study as they clearly acknowledge it. In addition, no evidence was provided for the reliability and validity of the study instrument.

Many of the recorded symptoms in the previous study were confirmed by Conner and Denson (1990), where gastrointestinal symptoms including nausea, heartburn, abdominal bloating/pain and appetite changes were reported. In addition, upper respiratory disturbances including colds, breathing difficulties and epistaxis, as well as pains like toothache, leg cramps, backache and urogenital irritations were included. Behavioural manifestations such as changes in sleeping patterns, reduced libido and restlessness were also reported. The time span of symptoms appears to follow a U-shaped pattern throughout the pregnancy cycle (Schodt, 1989). Symptoms commence

in the first trimester, largely disappear in the second and rise sharply again in the third. They then disappear either immediately on the birth of the child or shortly in the postpartum period.

An earlier epidemiological study by Lipkin and Lamb (1982) reported the same trend described by Schodt (1989). The sample consisted of the partners of 267 nulliparous and primiparous pregnant women who attended an antenatal clinic in New York. The mean age of men was 29 years with 90% being Caucasian. Having one or more symptoms during pregnancy was used as the criterion to define the presence of the syndrome. A “tracer” condition was also used to exclude the presence of illness diagnostically through a series of physical examinations and laboratory tests. There were two control periods, one before the pregnancy and one after parturition. Sixty men sought care for the symptoms of the syndrome, having a twofold significant increase in medical visits. They also experienced significantly more symptoms outside the control periods than during them compared to men who did not fulfil the criteria of the syndrome. Physical examination and laboratory investigations confirmed no pathological explanation for the symptoms. The investigators concluded that the woman’s pregnancy, and not illness, was the prime aetiological factor in the onset of the syndrome. This study was one of the few to show that men do seek medical care for the Couvade syndrome as well as the difficulties in diagnosing it. One notices, however, that this study included mainly Caucasian males with little ethnic diversity and recruited male partners attending a large health maintenance organisation which might have its socio-economic bias. The study also focused on physical signs with no psychological symptoms included. This was unfortunate, as the

study could have compared patterns of healthcare seeking for physical and psychological symptoms had the latter been included.

Bogren (1983) confirmed many of the reported symptoms of the syndrome. A psychiatrist conducted three semi-structured interviews during the 13<sup>th</sup> and 14<sup>th</sup> weeks of pregnancy, the week after delivery and 4-5 months postpartum. For mental symptoms, a global rating of illness was used. The duration of most of the Couvade mental symptoms showed no differences during the three periods investigated but a global rating of discomfort showed them to be more disabling when they did occur. There was no relationship between the symptoms of the syndrome in male partners and the somatic and psychological symptoms of female partners. This null relationship might be explained by sex differences in symptom reporting. Barsky 'et al' (2001) have confirmed this with women reporting more intense, more numerous and more frequent bodily symptoms than men *per se* but especially so during pregnancy. One would also expect a comment on the qualitative analysis of the interviews conducted, as it might be difficult to analyse all interview data in a quantitative way. The investigator has the advantage of choosing the analytical method and the technique of presenting the data, provided a sense of completion is provided to the reader. On this occasion, one wonders if more information could have been imparted through qualitative analysis of the interviews.

A prospective study by Clinton (1987), sought to measure the frequency and type of Couvade symptoms during each trimester of pregnancy and at the sixth week postpartum. The sample consisted of 81 expectant men with an age range of 18-44 years. Ninety percent of the men were married and of mixed ethnic origin. The

Expectant Father's Preliminary Health Interview (measuring 39 Couvade symptoms) and Expectant Father's Monthly Health Diary were used as the instruments for data collection. The mean number of Couvade symptoms reported in a typical month was 9.4 symptoms during the first trimester, 12.4 symptoms during the second trimester and 11.8 symptoms during the third trimester, which is not in agreement with the previous reports of U- shaped incidence of symptoms over the course of pregnancy. During the postpartum period, an average of 7.1 symptoms was reported, which also contradicts the previous reports on the disappearance of symptoms during this period. Depression was ranked among the ten top symptoms in the postpartum period. This finding was of interest since postpartum depression in men has rarely been acknowledged in the literature. The frequency of most of the Couvade symptoms ranged from less than 1 day to 2.5 days. The investigator acknowledged the methodological problem of being unable to obtain complete lunar month data sets from every study participant especially during the first two months of pregnancy. This was offset by condensing the data into three trimesters to obtain a sufficient number of values for the purpose of the analysis.

Sizaret **'et al.'** (1991) conducted an exploratory survey investigating Couvade symptoms experienced by expectant men during the first months of gestation and first week, third and fourth months of postpartum period. The sample included forty-two primiparous men (mean age 27) and 17 multiparous men (mean age 30). No social class data was provided. Data was collected by a questionnaire of somatic symptoms based on the literature. Twenty-four men (40%) suffered from the symptoms of the syndrome for at least one of the specified time periods. The most frequently reported during the first trimester were increase in appetite, gastritis, weight increase,

headache, diarrhoea and toothache. Those most frequent in the first week postpartum were appetite loss, increase of appetite, toothache, constipation, nausea and vomiting. Those in the third month postpartum included increase in appetite, headaches, toothache, indigestion, colic and diarrhoea. Like the Lipkin and Lamb (1982) investigation, the study ignores psychological symptoms. Additional limitations and omissions similar to some of the previous studies were also evident such as the small sample size curtailing generalisation of findings, failure to investigate the symptoms during the third trimester of pregnancy and no evidence provided for the reliability and validity of the study instrument. It was also curious that physical symptoms persisted into the postpartum period which contradicts the reported time course for the Couvade syndrome.

Khanobdee **'et al.'** (1993) investigated the incidence and duration of the syndrome among a purposive sample of 172 (age 19-50, mean 30) Thai men throughout pregnancy. One hundred and nineteen (69.2%) of the men were married. One hundred and fifteen men (67%) were having their first baby. Forty-seven men were primiparous and 10 had two children previously. Fifty-nine of the men (34.3%) were government officers and 55 (32%) were employed by private companies. A modified version of the 22-item Somatic Symptoms Checklist (Longobucco and Freston 1989) was used for data collection. Fifty men reported 2-4 symptoms; 44 reported 5-10 symptoms; 11 reported more than 10 symptoms. Seventy-nine (46%) reported the onset of symptoms in the first trimester. The physical symptoms were similar to those reported in the previous study, but psychological symptoms included mixed feelings of sadness and happiness, poor concentration, anxiety and increased sleep. Of the 79 men who reported symptoms in the first trimester 30 indicated their absence in the

second. In the third trimester the most frequently reported symptoms were polyuria, digestive problems, fatigue, poor concentration, anxiety and sleep disturbance. There were no statistically significant differences in the occurrence of symptoms between first-time expectant men and those who already had children, which confirms previous findings. Social class and level of education showed no relationship with the syndrome. The use of the questionnaire developed by Longobucco and Freston (1989) for monitoring the Couvade syndrome among males of Western European and North American origin might not have accounted for cultural differences in symptom expression and reporting by Thai men. In addition, there were no defining criteria for the syndrome provided in the study.

Chalmers and Meyer (1996) further reported similar symptoms for the syndrome. One hundred and fifty first-time South-African expectant men (age 18-40, mean 28 years) were recruited from two maternity hospitals in Johannesburg. All the men were Caucasian, of which 42% had technical or college education and 33% university degrees. The pregnancy was planned for 74% of the sample. A questionnaire relating to men's experiences of pregnancy was used. Physical Couvade symptoms that were reported included weight gain (17%), nausea (13%), back pain (11%) and weight loss (7%). Psychological symptoms included sleep disturbance (22%), anxiety in the last trimester (20%), extreme tiredness (13%), emotional lability (13%), and irritability (7%). There were no defining criteria for the syndrome introduced by the investigators. Moreover, the dominance of Caucasian males in the study population might hinder generalisation of the results to a population like that of South Africa.

Dissimilar physical, but similar psychological, symptoms to those presented in the previous investigation were reported by Tsai and Chen's (1997) in a cross-sectional study of two groups of Chinese men (age 26-35 years). The first group consisted of 150 married men whose partners were in the third trimester of pregnancy while the second group comprised 150 married men whose partners were not pregnant. Sixty-three percent of the samples were first-time expectant men. Eighty-five percent of the expectant men had a secondary and advanced level of education compared to 88% of the comparative group. Socio-economic status between both study groups was largely similar. A translated version of the 22-item Somatic Symptoms Checklist (Longobucco and Freston, 1989) was used for data collection. Sixty-eight percent of expectant men suffered from a higher number of somatic and psychological symptoms than the control group. These differences were statistically significant. The use of a questionnaire developed for a Western population, and apart from translation, with no attempt for adaptation, to investigate Chinese men who have different cultural attitudes might not be ideal. The study also focuses only on the third trimester period, with no attempt to investigate other important periods of gestation.

In the UK, Thomas and Upton (2000) used a 24-item questionnaire to investigate the somatic and psychological responses of 141 expectant men (age 16-51, mean 30 years) to their partners' pregnancy within its tenth week. There was a good dispersion of social class within the sample. A total of 49 expectant men (55%) had the previously reported symptoms of the syndrome while 92 men (65%) did not. However, the frequency of reporting anxiety was lower in this study as only 25 (18%) expectant men reported the symptom while 116 (82%) did not which contrasts with previous studies. Moreover, this finding might challenge assumptions that anxiety

causes the syndrome or is an intrinsic part of it. There was no association between the number of previous pregnancies or whether the pregnancy was planned or unplanned with the syndrome. This maintains the earlier inconsistencies in the findings examining the relationship between socio-demographic characteristics and the syndrome.

### **Physiological Mechanisms**

Few studies have examined a hormonal basis for the syndrome. Storey **'et al.'** (2000) compared repeated hormonal responsiveness in 34 couples during pregnancy and the postpartum period, divided chronologically into 4 groups: early prenatal (N=12, between 16-35<sup>th</sup> week of pregnancy); late prenatal (N=8, last 3 weeks before the birth); early postnatal (N=9, 3 weeks after birth); late postnatal (N=8, 4-7 weeks postpartum). All of the couples were first-time parents, while an additional three couples that were having their second baby were included in the analysis. All the study population were of European origin between the ages of 25-40 years. The levels of cortisol, prolactin and testosterone were repeatedly measured during pregnancy and the postpartum period for all male partners, while the levels of prolactin, cortisol and oestrogen were measured in the female partners. A "Situational Reactivity" test (auditory, visual, and olfactory cues from newborn infants) was used to monitor any short-term hormonal responses by the couples. The partners then completed a questionnaire on their pregnancy symptoms and responses to the baby stimuli after they provided a second blood sample.

Both men and women experienced significant changes in each of the 3 measured hormones during the early and late antenatal and postnatal periods. Prolactin levels

were statistically higher for men and women in the late antenatal compared to the early antenatal groups. Testosterone levels were 33% lower in men during the early postnatal period compared to those in the late antenatal period. Higher prolactin and cortisol levels and lower testosterone levels were evident in men who showed greater concern and responsiveness to baby stimuli. Prolactin levels were also higher and testosterone levels lower for men who reported more than 2 Couvade symptoms such as fatigue, appetite changes and weight gain compared to those who did not. No association between hormonal levels and anxiety were found among either sex, a finding that might be unexpected, particularly concerning cortisol as the relationship between the level of stress and cortisol is well documented (Rosmond 'et al.' 1998, Wolf 'et al.' 2001, Oswald 'et al.' 2006). Pregnancy-related anxiety for some men may have had an impact on the levels of cortisol and prolactin, a confounding effect that might have affected the study results. In addition, the small number of couples recruited might affect the balanced representativeness of the sample and generalisability of the findings. Nevertheless the study was important in showing that Couvade symptoms reflect physiological changes in men in preparation for fatherhood. Furthermore, the finding that hormonal changes between partners were both stage-specific and correlated might suggest a similar pattern for symptoms and their intensity across pregnancy in contrast to some previous studies.

Collectively these studies have shown the idiopathic nature of the Couvade syndrome and its symptoms for those affected and the physicians to whom they are referred. Male partners may undergo an exhaustive series of diagnostic tests without effect and frustrated physicians may too readily label their symptoms as “psychosomatic” in the search for a psychological basis. Some male partners may have no insight concerning

the association between the syndrome and pregnancy. It is imperative that the relationship between both is made explicit in initial consultations. It is also important to raise awareness and provide greater educational input to couples about the syndrome and its transient nature. The debilitating and distressing nature of Couvade symptoms may erode the quality of support men offer to their pregnant partners with adverse health consequences. With this in mind current antenatal care should address the man's health as much as it does the woman's. The referral of male partners to psychoanalysts or psychiatrists is unsurprising given the unconscious determinants of the syndrome and their somatic expression. Nevertheless both disciplines are ideally suited in providing supportive interventions which address the intensity of the expectant man's distress, not merely the nature of his symptoms.

### **Theoretical Concepts**

The theories proposed to explain the origins of the syndrome reflect varied orientations. The psychoanalytical perspective seems to be guided by Freudian psychology. The psychosocial view reflects a divergence of opinion concerning the man's role and status in pregnancy. Paternal theories hypothesise and provide contradictory evidence for the role of paternal preparation and involvement with the unborn child as determinants of the syndrome. Anxiety between expectant couples seems to be interconnected but the evidence for this is again inconsistent.

## **Psychoanalytical Theories**

### **Parturition Envy and Resurgence of Childhood Conflicts**

Psychoanalytical theories propose that the syndrome evolves from the man's envy of the woman's procreative ability. Historically Bohem (1930) first coined the term "Parturition envy" which he described as...

"Men imagine that parturition and conception are so complicated and uncanny, and because these processes are so mysterious to them, they have a passionate wish to share in them or else an intense envy of this capacity in women".

Similarly Rapheal-Leff (1991) argues that men's psychosomatic symptoms during gestation may reveal their unconscious need to experience the woman's pregnancy physically for themselves. Osofsky and Culp (1989) contend that some men develop parturition envy as a consequence of being bystanders in witnessing the evolution of foetal life.

According to Osofsky and Culp (1989) pregnancy for the male partner acts as a catalyst for the emergence of ambivalence and resurgence of Oedipal conflicts. The event may cause regression, with passivity and dependency being intensified by the developing foetus which conflicts with the man's need for autonomy. Gerzi and Berman (1981) attempted to demonstrate this in their study of 51 Israeli men whose partners were in the third trimester of pregnancy. They were matched against a control group of 51 men whose partners were not pregnant. Data was collected by the Blacky Picture test (Blum 1949) to investigate the unconscious dimensions of the pregnancy experience. A Hebrew translation of the IPAT Anxiety Scale Questionnaire (Cattell and Scheier, 1976) assessing symptomatic and covert anxiety was also used.

Interviews were conducted in the hope of using them to reach a better understanding of the statistical findings. The study showed statistically significant differences in Oedipal intensity, sibling rivalry reactions and guilt feelings for those in the experimental group compared to controls. Six of the men in the experimental group revealed considerable ambivalence directly related to re-aroused infantile fantasies, feminine identifications, castration fears and Oedipal themes. Attempts to defensively repress ambivalent feelings toward the pregnancy through the processes of negation, denial, repression, intellectualisation and reaction formation also surfaced. This study was one of the few to have statistically established the involvement and frequency of Oedipal dynamics within the last three months of the woman's pregnancy when symptoms of the Couvade syndrome are known to be most prevalent. However it only focused on psychological symptoms and did not include physical ones. The use of the IPAT Scale which only measures anxiety proneness but not situational anxiety relating to the event of pregnancy might pose a problem. The analysis of men's subconscious responses to the Blacky Picture test was prone to potential subjective interpretation.

### **Foetus as Rival**

The second psychoanalytical theory proposes that expectant fathers may sometimes view the unborn child as a rival for maternal attention. Mayer and Kapfhammer (1993) argue that a central concern of prospective fathers is the loss of their partner to the newborn infant. May's (1975) work on the involvement of men in pregnancy confirmed a widening distance between some of them and their partners especially during the first trimester. She concluded that excessive jealousy of the unborn might have caused this rift especially among men whose dependency needs were

insufficiently or ambivalently satisfied in childhood. Some argue that the man whose choice of a partner is primarily based on such needs will often view the foetus as a rival for dependency. The pregnancy may then confront him with the truth that he is now no longer a child but rather an adult with increased paternal responsibilities. This in turn results in the frustration of his dependency needs.

The expectant man's perception of the foetus as a competitor may also reactivate earlier conflicts of sibling rivalry. These are most likely to occur in those who had younger siblings but who experienced a loss of maternal attention and care as a consequence. Some psychoanalysts explain this as a symbolic re-interpretation of the foetus as the historical sibling and the pregnant woman as the biological mother from whom attention is diverted. Malthie 'et al.' (1980) corroborate this in a case-report of a 26-year-old married man with sharp, incapacitating pains in his abdomen, sacral area and lower back which were accompanied by episodic vomiting. The symptoms coincided with his partner's announcement of conception. The investigators concluded that the symptoms represented a regressive manifestation of narcissistic injury which he experienced earlier when he lost his favoured position with his mother on the birth of his sibling. The man's rage at his partner was then replaced by identification with her and subsequently expressed as physical pain. The same theme was also highlighted by Sizaret 'et al.' (1991) who concluded that the gastrointestinal symptoms of male partners in their study signified identification with their early biological mothers.

Three main criticisms can be levied at the psychoanalytic perspective in its attempt to explain the aetiology of the Couvade syndrome. One is the fact that many

psychoanalytic theories continue to remain scientifically untested. Secondly, the subconscious interpretations and conflicts, the alleged causal antecedents of the syndrome have mainly been derived from case studies or reports. These are prone to subjective interpretation and difficult to generalise. Thirdly, the men in such studies have been referred to psychoanalysts or psychiatrists for treatment which does not accord with the established defining criteria of the syndrome being explained by psychological or physical illness. However, one needs to be cautious in assuming that men with a psychological illness either causes or precludes the syndrome. They might simply have been referred or sought treatment from psychoanalysts or psychiatrists for Couvade symptoms which was not surprising given their idiopathic nature and physicians failure to diagnose them.

## **Psychosocial Theories**

### **The Marginalisation of Men During Pregnancy and Birth**

While psychoanalytical theories highlight the man's inner conflicts, psychosocial theories focus on those concerning his role and status during pregnancy and propose that these also impact upon his health. This theory proposes the marginalisation of men during the woman's gestation and birth as an important antecedent of the syndrome. While the role of motherhood constitutes an important defining attribute for women the same may not be true for fatherhood and men. Expectant women have their maternity careers endorsed commercially, socially and medically in contrast to prospective fathers. The famous anthropologist Margaret Mead (1949) discerned this when she argued that the problem of civilisation was to define the male role satisfactorily enough to provide men with a sense of achievement naturally granted to women in childbirth. The societal recognition accorded to many men is that they play

a peripheral role during pregnancy and childbirth thus accepting this as a mere token acknowledgement of their existence. David (1985) alludes to this further by proposing that fatherhood as a meaningful social concept within contemporary society has rarely been affirmed beyond its procreative role.

The respective epistemological relationship of men and women with their unborn child is undoubtedly different. The woman's awareness of, and the maternal relationship with, her unborn occur through an internalised, sensory, tactile and kinaesthetic experience. The man, on the other hand, often experiences his unborn child vicariously with access being sanctioned by his pregnant spouse. May (1980) concurs by proposing that it is largely the pregnant woman who determines the extent of the father's involvement during pregnancy and childbirth. Within antenatal care it is the primacy of the woman's health which is deemed paramount often at the expense of the man's. In response, expectant men may develop what Mayer and Kapfhammer (1993) term their own "pseudo-pregnancy" with all its somatic symptoms. Yet not everyone would agree that expectant men are confined to the realms of obscurity within what is claimed to be a matricentric world. The feminist perspective rejects the notion of male marginalisation in this context. They argue for the progressive rise of men's new gender roles involving a more child-centred approach to family life along with increased participation in domestic labour. Many men are now more actively involved in pregnancy and the birth process where once they were excluded. Masoni *'et al.'* (1994) pursue a similar line of argument and assert that for many men pregnancy and baby care are no longer an exclusive female heritage. It is the men who tend to maintain a separation so as to uphold traditional male values and paternal roles. Lamentably there is a dearth of research exploring the relationship between

men's perceptions of, and responses to, pregnancy with the Couvade syndrome in this context.

### **Transition to Fatherhood as a Developmental Crisis**

For women the transition to parenthood is fraught with a bewildering array of psychosocial changes. This transition for men may equate to that of motherhood. While the pregnancy experience is often shared, the concerns and emotions that it induces are undoubtedly gender-specific. However within the literature it is often mistakenly implied that the concerns and emotions of expectant men and women are synonymous. Scopesi and Repetto (1990) propose that impending fatherhood is one of the most crucial phases in human life. Klein (1991) contends that pregnancy constitutes one of the most cataclysmic periods for the expectant man. Men usually accept pregnancy without any concomitant physical changes to reinforce its reality. In such instances some men may experience higher than normal levels of physical symptoms during their partners' pregnancy. Clinton (1986) concurs on the basis of her observations arguing that the Couvade syndrome is a reactive response to the developmental crisis of pregnancy.

Polomeno (1998) alludes further to the transitional crisis facing men. He proposes that the change from dyad to triad is so abrupt that many men may not be prepared for their new paternal roles. Jordan (1990) views the struggle of prospective fatherhood as 'labouring for relevance'. This involves incorporating the paternal role into the man's identity. Expectant men have to come to terms with a changed sense of self during this period of on-going transition. In some instances the developmental process remains incomplete, so that not all men achieve actualisation as involved fathers.

Similarly Imle (1990) argues that men have to assimilate the identity of “father” into their self-concept. They then need to develop this role to give shape to this new self-image. For some the role may differ considerably from that enacted by their own fathers. For others there may even have been no paternal role model to emulate. These life circumstances can lead to transitional difficulties or crises. Despite much speculation as to the relationship between parental transition and the syndrome there is also a notable scarcity of studies here. This contrasts with those exploring the relationship of the syndrome with men’s involvement in pregnancy and/or their paternal role preparation.

## **Paternal Theories**

### **Relationship Between Father Involvement In Pregnancy and Role Preparation**

Along similar lines to the two previous theories considered paternal theories reveal the emotional conflicts which men face. However, in contrast to psychoanalytical theories it is the man’s closeness to the foetus that gives rise to the syndrome. Paternal theories like psychosocial ones also emphasise the interconnection between the expectant man’s role and Couvade symptomatology. May (1980) outlined a typology of men’s detachment or involvement styles during pregnancy, namely the observer, instrumental and expressive styles. The observer style describes those men who remain on the periphery, which allows the man as much or as little involvement as he chooses. The instrumental style typifies men who assume a managerial role toward the pregnancy. These men perceive their contribution as organising their spouses’ antenatal visits and ensuring adherence to dietary prescriptions. Finally, the expressive style is one where men express their emotion about the pregnancy and view themselves as active participants in the process.

In 1982, May further elaborated on men's involvement, identifying three phases: the announcement, the moratorium, and focusing phases. The announcement phase refers to the period between the man's suspicion of the pregnancy and its actual confirmation. His response will be dependent on whether the pregnancy is desired or not. The moratorium phase is characterised by the man's emotional distance from the pregnancy thus allowing him to work through any related ambivalence. This phase lasts between the 12<sup>th</sup> and 25<sup>th</sup> week of gestation. Between 26<sup>th</sup> to 39<sup>th</sup> weeks up to delivery, the man experiences a change in attitudes and feelings toward the pregnancy with a redefinition of himself in terms of his new parental role. The man's positive and negative emotional responses to his partner's gestation may be linked to his health state during that time. If a positive emotional response to the pregnancy can be taken to mean greater involvement then this would be in agreement with Clinton (1985) and Drake *'et al.'* (1988), who conclude that the man's somatic symptoms are often reframed as evidence of his involvement in the processes of gestation and childbirth. Raphael-Leff (1991) contends that the adoption of extreme styles toward the pregnancy such as that of "extreme participator" or "extreme renouncer" may increase men's susceptibility to developing Couvade symptoms.

The relationship between the level of men's involvement in pregnancy, role preparation and the Couvade syndrome has been confirmed in a number of studies. The majority demonstrate that the higher the level of men's involvement and the greater degree of their role preparation, the more frequent the display of Couvade symptoms. Clinton (1987) found that affective involvement within the pregnancy was positively correlated to the number, duration, and seriousness of symptoms of expectant men in comparison to non-expectant men. Similarly Longobucco and

Freston (1989) found statistically significant higher mean scores of pregnancy-related symptoms evident for those who had a greater degree of role-preparation and involvement in their partners' pregnancies. Part of the process of involvement is the man's attachment to his unborn child which might also be related to the syndrome. Two investigations have pursued this line of inquiry but with contradictory results. Weaver and Cranley (1983) investigated this in a convenience sample of 100 white middle class first-time expectant men. They found a modest correlation ( $r = 0.23$ ,  $p \leq 0.05$ ) between paternal-foetal attachment and the incidence of six physical symptoms of the syndrome. These included feeling more tired (34%), sleeping difficulties (33%), indigestion (14%), stomach upsets (12%), appetite changes (8%) and constipation (6%). The investigators concluded men's symptoms were a reflection of their level of attachment to the unborn child and involvement in the pregnancy. By contrast, Schodt (1989) found no relationship between symptoms of the syndrome and paternal-foetal attachment. Ferketich and Mercer (1989) in their 18 month study of 147 couples over pregnancy and postpartum period found that the earlier male partners felt foetal movements, the more positive the perception of their own health throughout the latter periods of gestation.

### **The role of anxiety**

Inevitably the event of pregnancy confronts male and female partners with multiple anxieties and concerns. These often centre on the impact of the changing dyadic relationship to a triadic one. Anxieties may also relate to transition and preparation for future fatherhood. There may be additional concerns about the health of the unborn child and the woman during the periods of gestation and childbirth. A number of studies have examined the relationship between anxiety and the Couvade syndrome.

Trethowan and Conlon (1965) as well as Lukesch (1977) found that men with the syndrome often reported more anxiety. Bogren (1983) found that men's anxiety was more common when the woman was anxious about the pregnancy and impending birth. The investigator concluded that the woman's anxiety seemed to be more important for the development of the syndrome than that of the male partner. Transference of, or shared anxiety between, the couples might explain the situation. Cutrona's (1996) Family Theory on conjugal dyads proposes the existence of an anxiety-feedback loop between partners whereby when one is stressed (the pregnant woman), the other (the male partner) would typically offer support. Once the stressed partner has recovered, the supporting partner may in turn become stressed and anxious along with a deterioration of his physical or psychological health.

Strickland (1987) confirmed that the total number of the pregnancy-related symptoms exhibited by male partners was directly related to their anxiety levels. Brown (1988) found a concurrent display of Couvade symptoms with other manifestations suggestive of anxiety. In a population of 313 couples, she reported anxiety-related symptoms in the form of worry (22%), feeling under stress and strain (20%), tension (19%) and inability to relax (10%). Thomas and Upton (2000) dispute these findings on the basis of their results where no corresponding proportions between the syndrome and anxiety were evident. The problem with some studies in this area is their tendency to use anxiety and stress interchangeably as opposed to treating them as separate entities in their relationship with the syndrome and providing accurate definitions for each. Some of the problems might stem from the inherent difficulties in determining whether anxiety is the causal agent for the syndrome or its consequence.

## **Conclusion**

The Couvade syndrome is a global phenomenon occurring in developed countries. Many definitions of the syndrome have been offered with some indicating the presence of physical symptoms only while others include psychological symptoms as well. Some authors argue that the syndrome is a psychosomatic disorder while others indicate its idiopathic nature with no connection to physical or mental illness. It is clearly connected to pregnancy and characteristically disappears in the postpartum period. The incidence has been shown to vary widely across countries and its relationship with socio-demographic factors is inconsistent. Both of these might be explained by problems of subject definition, sample size variation, ethnic distribution, cultural and age differences across different studies or it might just be that the syndrome is multifactorial. The defining criteria for the syndrome is absent in some investigations, presented differently in some and similarly in others. Some studies have only assessed physical symptoms while others have also included psychological manifestations. In many cases sampling selection bias has been evident with men recruited from backgrounds that focus on a predominant ethnic group only, with the near exclusion of others, certain socio-economic classes, and geographical distributions. Inconsistencies in the type of symptoms revealed may reflect inherent methodological difficulties associated with the use of multiple and varied measures of the syndrome across studies. A plethora of psychoanalytical, psychosocial and paternal theories have been offered to account for the origins of the syndrome. However, some have not been investigated and those which have show disparate findings.

Further research is needed in order to settle the differences between many of the reported studies and to further explore the manifestations and level of expression of the symptoms and signs of the syndrome. Moreover, the possible impact of the syndrome on conjugal relationships, the physical and psychological health of both partners and on healthcare costs needs to be explored. Large scale studies that use both a qualitative approach, to allow the male partners to express their experiences of the syndrome in their own language, and a quantitative approach which is based on the themes and sub-themes developed from the qualitative study, in order to quantify the severity of the manifestations and their impact on the level of distress for men, and their partners, are needed. The quantitative side of the study should be performed in a sizable number of male partners of different ethnic groups and socio-demographic backgrounds in order to be able to assess the impact of these factors and retain enough numbers for statistical power. In addition, quantitative approaches might be helped by standardisation of study instruments across investigations.

## References

American Psychiatric Association (2000) **Diagnostic Statistical Manual of Mental Disorders (DSM-1V)**, American Psychiatric Press, 6<sup>th</sup> ed. Washington DC.

Barsky, A. J., Peekna H. M., Borus, J. B. (2001) Somatic symptom reporting in women and men. **Journal of General Internal Medicine**, **16** (4): 226-275.

Blum, G.S. (1949) A Study of the Psychoanalytic Theory of Psychosexual Development. **Genetic Psychology Monographs**, **39**: 3-39.

Bogren, L.Y. (1983): Couvade.  
**Acta Psychiatrica Scandinavica**, **68** (1): 55-65.

Bogren, L.Y. (1984) The Couvade Syndrome: Background Variables. **Acta Psychiatrica Scandinavica**, **70** (4): 316-320.

Bogren, L.Y. (1989): Pregnancy Symptoms in the Expectant Man. **Journal of Psychosomatic Obstetrics and Gynaecology**, **10**: 43-51.

Bohem, F. (1930) The Femininity-Complex in Men. **International Journal of Psychoanalysis**, **11** (4): 444-469.

Brown, M. (1988) A Comparison of Health Responses in Expectant Mothers and Fathers. **Western Journal of Nursing Research**, **10**: 527-549.

Cattell, R. B. and Scheier, I. H. (1976): **IPAT Anxiety Scale Questionnaire Self-Analysis Scale (Hebrew version)**. University of Tel Aviv, School of Education. Tel Aviv, Israel.

Chalmers, B. and Meyer, D. (1996) What men say about pregnancy, birth and parenthood. **Journal of Psychosomatic Obstetrics and Gynaecology**. **17** (1): 47-52.

Clinton, J. (1985) Couvade: Patterns, Predictors, and Nursing Management: A Research Proposal submitted to the Division of Nursing. **Western Journal of Nursing Research**, 7 (2): 221-243.

Clinton, J.F. (1986) Expectant Fathers at Risk of Couvade. **Nursing Research**, 30: 281-284.

Clinton, J.F. (1987) Physical and Emotional Responses of Expectant Fathers Throughout Pregnancy and the Early Postpartum Period. **International Journal of Nursing Studies**, 24 (1): 59-68.

Condon, J.T. (1987) Psychological and Physical Symptoms During Pregnancy: A Comparison of Male and Female Expectant Parents. **Journal of Reproductive and Infant Psychology**, 5: 207-219.

Conner, G.K. and Denson, V. (1990) Expectant Fathers' Response to Pregnancy: Review of the Literature and Implications for Research in High-Risk Pregnancy. **Journal of Perinatal and Neonatal Nursing**, 4 (2): 32-42.

Cutrona, C.E. (1996) **Social Support in couples**. Sage Publications, California.

David, M. (1985) Motherhood and social policy: a matter of education? **Critical Social Policy**, 12: 28-43.

Davis, O.S. (1978) Mood and Symptoms of Expectant Fathers During the Course of Pregnancy: A Study of the Crises Perspective of Expectant Fatherhood. **Dissertation Abstracts International**, 38: 5741A.

Dickens, G. and Trethowan, W. A. (1971) Cravings and Aversions During Pregnancy. **Journal of Psychosomatic Research**, 15: 259-268.

Drake, M. L., Verhulst, D., and Fawcett, J. (1988) Physical and Psychological Symptoms Experienced by Canadian Women and Their Husbands during Pregnancy and the Postpartum. **Journal of Advanced Nursing**, 13 (4): 436-440.

Fawcett, J. and York, R. (1986) Spouses' physical and psychological symptoms during pregnancy and postpartum. **Journal of Nursing Research** 35 (3): 144-148.

Ferketich, S.L. and Mercer, R.T. (1989) Men's Health Status During Pregnancy and Early Fatherhood. **Research in Nursing and Health**, 12 (1): 137-148.

Gerzi, S. and Berman, E. (1981): Emotional Reactions of Expectant Fathers to their Wives' First Pregnancy. **British Journal of Medical Psychology**, 54: 259-265.

Imle, M.A. (1990) Third Trimester Concerns of Expectant Parents in Transition to Parenthood. **Holistic Nursing Practice**, 4: 25-35.

Jordan, P.L. (1990) Labouring for relevance: Expectant and New Fatherhood. **Nursing Research**, 39: 11-16.

Khanobdee, C., Sukratanachaiyakul, V., and Templeton, G.J. (1993) Couvade Syndrome in Expectant Thai Fathers. **International Journal of Nursing Studies**, 30 (2): 125-131.

Klein, H. (1991) Couvade Syndrome: Male Counterpart to Pregnancy. **International Journal of Psychiatry in Medicine**, 21 (1): 57-69.

Lipkin, M. and Lamb, G.S. (1982) The Couvade Syndrome: An Epidemiological Study. **Annals of Internal Medicine**, 96: 509-511.

Longobucco, D.C. and Freston, M.S. (1989) Relation of Somatic Symptoms to Degree of Paternal-Role Preparation of First-Time Expectant Fathers. **Journal of Obstetric, Gynaecological, and Neonatal Nursing**, 18 (6), 484-488.

Lukesch, H. (1977): Das Auftreten von Couvade-Symptomen. **Weinscher Medical Wochenscher**, 127: 198-201.

Magalini, S.I. and Magalini, S.C. (1997) **Dictionary of Medical Syndromes**. Lippincott-Raven, 4<sup>th</sup> ed. Philadelphia.

Malthie, A.A., Cavenar, J., O. O' Shanick G.J., and Valou, M.R. (1980): A Couvade Syndrome Variant: Case Report. **North Carolina Medical Journal**, **41** (2): 90-92.

Marilov, V. V. (1997) The Couvade Syndrome (Russian). **Zhurnal Nevrologii Psikhiatrii**, **97** (12): 65-67.

Masoni, S., Maio, A., Trimarchi, G., de Punzio, C., and Fioretti, P. (1994) The Couvade Syndrome. **Journal of Psychosomatic Obstetrics and Gynaecology**, **15** (3): 125-131.

Mason, C. and Elwood, R. (1995) Is there a Physiological Basis for the Couvade and the Onset of Paternal Care. **International Journal of Nursing Studies**, **32** (2): 137-142.

May, K.A. (1975) Psychological Involvement in Pregnancy by Expectant Fathers. **Journal of Obstetric, Gynaecological and Neonatal Nursing**, **4** (2): 40-42.

May, K.A. (1980) A typology of Detachment / Involvement Styles Adopted During Pregnancy by First-Time Expectant Fathers. **Western Journal of Nursing Research**, **2** (2): 445-453.

May, K. A. (1982) Three Phases of Father Involvement in Pregnancy. **Nursing Research**, **31** (6), 337-342.

Mayer, C. and Kapfhammer, H.P. (1993) Couvade Syndrome, An Illness in the Transition to Fatherhood. **Fortschirt Der Neurologie-Psychiatrie**, **61** (10): 354-360.

Mead, M. (1949) **Male and Female: A Study of the Sexes in a Changing World**. Victor Gollancz, London.

Meigs, A. S. (1976) Male pregnancy and the reduction of sexual opposition in a New Guinea highlands society. **Ethnology** **15**, 393-407.

Munroe, R.L. and Munroe, R.H. (1971) Male Pregnancy Symptoms and Cross-Sex Identity in Three Societies. **Journal of Social Psychology**, **84**: 11-25.

Munroe, R.L., Munroe, R.H., and Nerlove, S.B. (1973): Male Pregnancy Symptoms and Cross-Sex Identity: Two Replications. **Journal of Social Psychology**, **89**: 147-148.

Munroe, R. L. (1980) Male Transvestism and the Couvade: A Psycho-Cultural Analysis. **Ethos** **8**: 49-59.

Osofsky, H. J. and Culp, R. E. (1989): **Risk factors in the transition to fatherhood**. In: Cath S. H., Gurwitt A., and Gunsberg L. (Ed.): **Fathers and their families**. The Analytic Press, New Jersey.

Oswald, L. M., Zandi, P., Nestadt, G., Potash, J. B., Kalaydjian, E., and Wand, G. S. (2001) Relationship between cortisol responses to stress and personality. **Psychoneuroendocrinology** **26**: 711-720.

Polomeno, V. (1998) Health Promotion for Expectant Fathers: Part 1. Documenting the Need. **The Journal of Perinatal Education**, **7** (1): 1-8.

Rapheal-Leff, J. (1991) **Psychological process of childbearing**. Chapman and Hall, London.

Rosmond, R., Dallman, M. F., and Björntorp, P. (1998) Stress-related cortisol secretion in men: Relationships with abdominal obesity and endocrine, metabolic and hemodynamic abnormalities. **Journal of Clinical Endocrinology and Metabolism**, **83** (6): 1853-1859.

Schodt, C. M. (1989) Paternal-fetal Attachment and Couvade: A Study of Patterns of Human-Environment Integrality. **Nursing Science Quarterly**, **2** (2): 88-97.

Scopesi, A. and Repetto, I. (1990) Becoming a Father: A Critical Stage? **Journal of Reproductive and Infant Psychology**, **8**: 283-284.

Sizaret, P., Degiovanni, A., Gaillard P., and Benichou, C. (1991) Study on the somatic symptoms of couvade. **Annals of Medical Psychology**, **149** (3): 230-233.

Storey, A. E., Walsh, C. J., Quinton, R. L., and Wynne-Edwards, K. E. (2000) Hormonal correlates of paternal responsiveness in new and expectant fathers. **Evolution and Human Behaviour**, **21** (2): 79-95.

Strickland, O.L. (1987) The Occurrence of Symptoms in Expectant Fathers. **Nursing Research**, **36**: 184-189.

Taylor, D.M. (1951) **The Black Carib of British Honduras**. Viking Fund Publications in Anthropology 17. Wenner-Gren Foundation for Anthropological Research Incorporated, Yale.

Thomas, S.G. and Upton, D. (2000) Expectant Fathers' Attitudes Toward Pregnancy. **British Journal of Midwifery**, **8** (4): 218-221.

Trethowan, W. H. and Conlon, M. F. (1965) The Couvade Syndrome. **British Journal of Psychiatry**, **111**: 57-66.

Trethowan, W.H. (1972) The Couvade Syndrome. In Howells, J.G. (Ed), **Perspectives in International Child Psychiatry**, pp. 67-93. Oliver and Boyd, Edinburgh.

Tsai, S. and Chen, C. (1997) Somatic symptoms, stress and social support of expectant fathers (Chinese). **Nursing Research**, **5** (5): 439-451.

Tylor, E. B. (1865) **Researches into the early history of mankind and the development of civilisation**. Murray 2<sup>nd</sup> ed. London.

Weaver, R.H. and Cranley, M.S. (1983) An Exploration of Paternal-Fetal Attachment Behaviour. **Nursing Research**, **32** (2): 68-72.

Wolf, O. T., Schommer, N. C., Hellhammer, D. H., McEwen, B. S., and Kirschbaum, C. (2006) The relationship between stress-induced cortisol levels and memory differs between men and women. **Neuropsychopharmacology**, **31**: 1583-1591.

World Health Organisation (1993) **International Classification of Diseases (ICD-10)**, WHO, 10<sup>th</sup> ed. Geneva.