

## Vicious Cycle Between Stress and Infertility

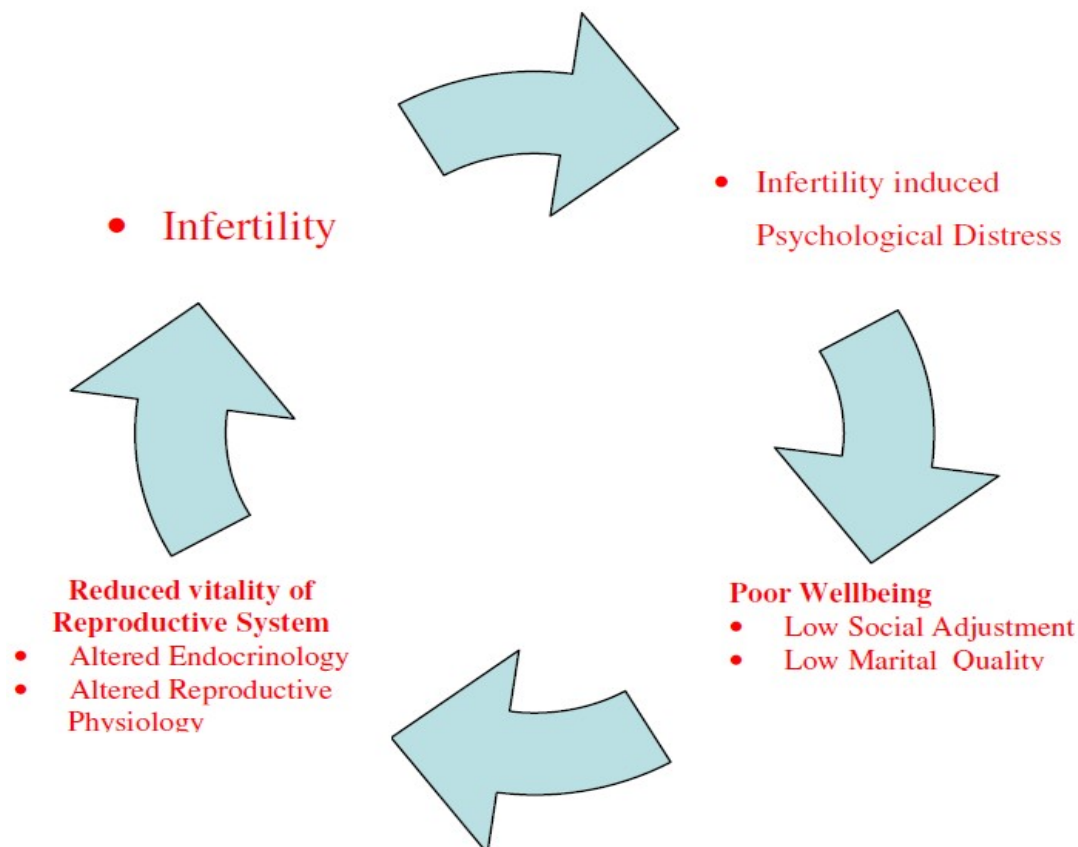
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### Abstract

*The vicious cycle between stress and infertility was developed on the basis of a Quasi experimental study in Kerala, India on “Quality of life of couples with infertility before and after adoption of child”. A pre test post test control group design was used in the study. The study was designed to investigate the effect of adoption on quality of life of infertile couples. One of the dependent variables of the study was psychological distress. The major objective of the study was to identify the effect of adoption on psychological distress among infertile couples. The study investigated the perceived psychological distress and assessed the difference in level of psychological distress among couples at various points after adoption among Indian infertile couples. It is noticed that some couples who are medically certified as infertile, which is a mandatory document for adoption spontaneously conceive after adoption. Though infertility is considered and managed as a physical entity, the psychological component which has a vital role is often neglected or overlooked. An effective reduction in psychological stress will not unblock obstructed fallopian tubes, create sperm or resurrect declining ovaries but may help fertility problems of an unexplained or hormonal nature.<sup>1</sup> The study explains the phenomena behind spontaneous conception after adoption. The improvement in the wellbeing of couples experienced after adoption may improve reproductive functions and fertility among couples which points to the possibility for better outcome of infertility treatment or even spontaneous conception after adoption. This study invites attention to the psychological component of infertility.*

The findings of the present study observed that infertility is a major cause of psychological distress and adoption of child result in reduction of psychological distress. The findings of the study also revealed that spontaneous conception among infertile couples is a reality and it can be explained in terms of improvement in quality of life as a result of adoption. The results of the study indirectly throws light to the hidden corner of psychological component of infertility with regard to menstrual irregularities, polycystic ovarian diseases, sexual problems of unexplained nature, poor fertility and poor outcome of infertility treatment.

The findings of the present study identified a vicious cycle operating between infertility and psychological distress. The vicious cycle formulated in the study is also based on theories and studies related to infertility. The present findings are supported by an already existing vicious cycle between emotional tension and infertility.<sup>2</sup> Findings of the present study are put together to develop a vicious cycle between psychological distress and infertility and is presented in figure 1.



**Figure 1.** Vicious Cycle between Psychological Distress and Infertility

It is a fact that infertility results in stress for couples. It is also a fact that psychological distress has an adverse effect on the endocrine and immune systems of the body. There can be a possible connection between infertility and resultant stress on perpetuation of infertility or failure of infertility treatment. This can be due to a change in endocrinology or reproductive functions as a result of infertility related stress. Understanding the connection between the two is therefore very important in dealing with infertility. Infertility is mainly of two types, namely structural and functional infertility. Structural Infertility is due to structural defects of male and female reproductive systems like congenital or acquired anomalies of testes, uterus, ovaries and fallopian tubes.<sup>3</sup> Psychopathology has no role in this type of infertility. Functional infertility is attributed to abnormal psychological functioning on the part of one or both individuals of the couple. It is the major cause of failure to conceive in as many as 80% of cases and also denoted as psychogenic infertility<sup>3</sup>. In such cases reproductive failure is the result of psychological and emotional factors. Psychogenic infertility is supposed to occur because of unconscious anxiety about sexual incompetence, ambivalence toward motherhood or due to conflicts of gender identity<sup>1</sup>.

The impact of stress changes the pattern of personal relations of infertile couples. Being stressed disrupts sexual intimacy and results in marital distress among couples. The hurdles in investigations, diagnosis and treatment of infertile couples affect sexual relationships and marital relationships adversely resulting in low quality of marital life. As duration of infertility increases infertile couples are not in a position to comfort each other since both are equally in distress. The marital relationships can be strained because of the fear that the fertile partner will leave the infertile partner. It can also alienate the couples from friends and relatives cutting off sources of support. Since such couples are always irritable, tense, and angry they get a reputation as being

'difficult individuals.'<sup>2</sup> In order to escape from social questions related to childlessness couples generally avoid social situations where children are present. Infertile couples demonstrate social withdrawal and isolation due to the social stigma of infertility. Altogether the general wellbeing of couples deteriorates markedly as they experience unpleasant emotions, negative moods and poor life satisfaction.<sup>3</sup>

Psychological distress has got negative effects on general endocrinology and glandular functions which in turn alters reproductive endocrinology and reproductive functions. In response to stress the hypothalamus produces a hormone called Corticotrophin Releasing Factor (CRF) which activates the hypothalamic-pituitary-adrenal (HPA) system. This system releases neurotransmitters (chemical messengers) called catecholamine as well as cortisol, the primary stress hormone. Stress boosts levels of stress hormones such as cortisol that inhibit the body's main sex hormone, Gonadotropin Releasing Hormone (GnRH). Subsequently it suppresses sperm count, ovulation and sexual activity. Since the hypothalamus regulates both stress responses as well as the sex hormones, it is easy to see how biologically stress could cause infertility in some women.<sup>3</sup> Excessive stress may even lead to complete suppression of the menstrual cycle and this is often seen in female marathon runners who develop 'runner's amenorrhea'. In less severe cases it could cause an ovulation or irregular menstrual cycles.<sup>4</sup> It is revealed that when activated by stress, the pituitary gland also produces increased amounts of prolactin and elevated levels of prolactin could cause irregular ovulation. Since the female reproductive tract contains catecholamine receptors, catecholamine produced in response to stress may potentially affect reproductive functions. It could interfere with the transport of gametes through the fallopian tubes or by altering uterine blood flow.<sup>5</sup> Also many women start overeating in response to the stress of infertility. The increased fat cells then disrupt the hormonal balance, making the situation even worse.<sup>2</sup>

It is found that stress can reduce sperm counts as well. Testicular biopsies obtained from prisoners awaiting execution who were obviously under extreme stress revealed complete spermatogenetic arrest in all cases. Researchers have also found significantly lower semen volume and sperm concentration in such men.<sup>6,7</sup> In addition to these direct effects stress can also suppress libido, cause erectile dysfunction, and result in a reduction in the frequency of intercourse which in turn could also reduce fertility.

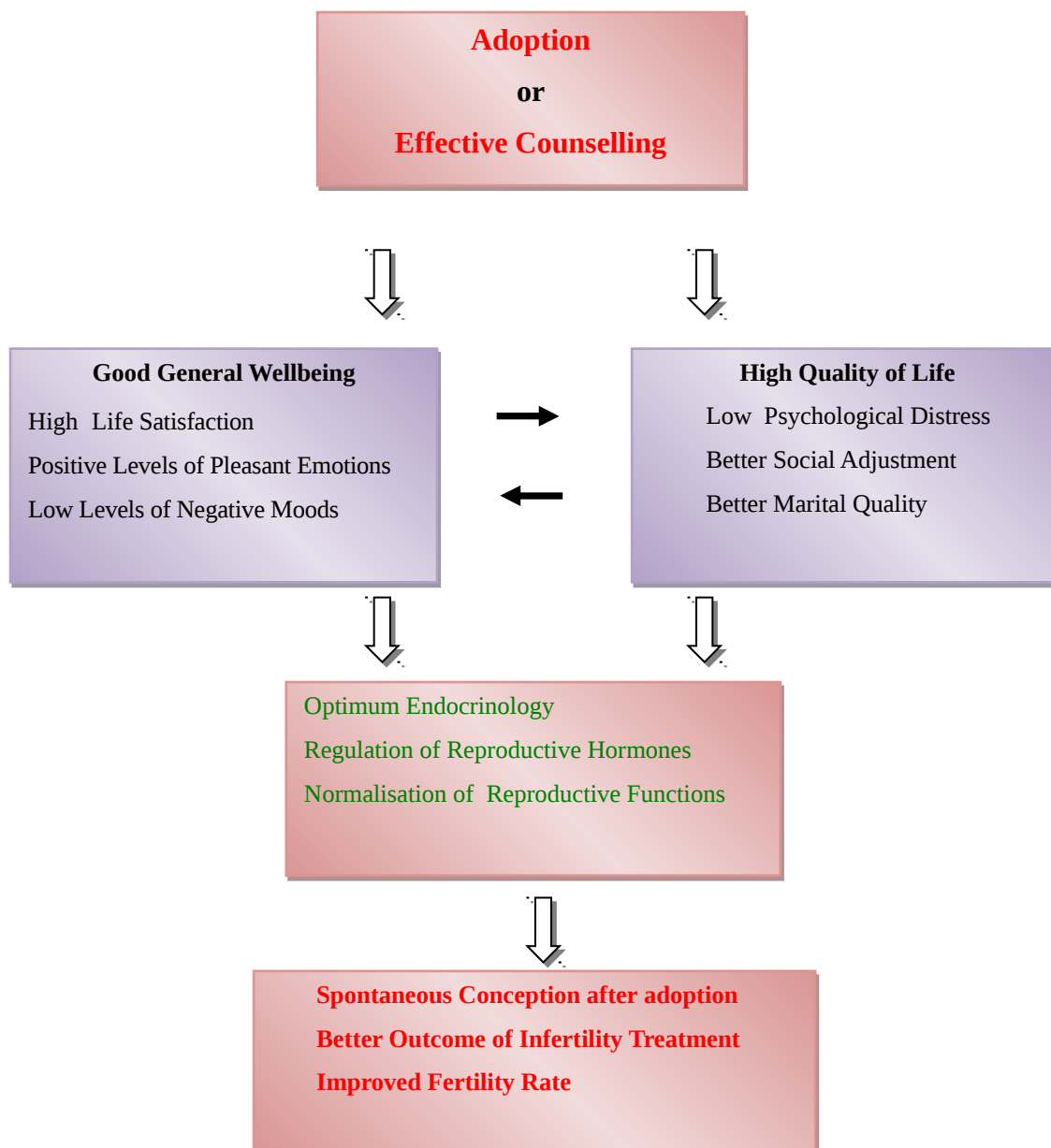
Stress and infertility often have a circular relationship and they can aggravate each other setting up a vicious cycle. Infertile couples who are under stress start blaming selves. This increases their stress levels and further aggravates the problem. As one mind-body expert said "Stress causes illness causes more stress which causes more illness".<sup>8</sup>

In brief, although infertility has an effect on a couple's mental health, different psychological factors have been shown to affect the reproductive ability of both partners. Proposed mechanisms through which stress could directly affect infertility involve the physiology of the depressed state such as elevated prolactin levels, disruption of the hypothalamic-pituitary-adrenal axis and thyroid dysfunction. Depression is associated with abnormal regulation of luteinizing hormone which in turn regulates ovulation. Changes in immune function associated with stress and depression may also adversely affect reproductive functions. Since stress is also associated with similar physiological changes, this poses the possibility that a history of high levels of cumulative stress associated with recurrent depression or anxiety may also be a causative factor of infertility. Therefore ignoring the psychological factors related to infertility and merely considering these problems as medical will create huge obstacles in understanding human beings as an integrative whole. There is no doubt that infertility like other physiological phenomenon has social and psychological aspects and it is classified in the realm of behavioural sciences.<sup>9</sup>

The improved general wellbeing among couples experienced after adoption carries the possibility of improved reproductive physiology, endocrinology and higher fertility. On analysing the psychosomatic effects of infertility, it is found that psychological distress alters levels of hormones cortisol, prolactin, and progesterone which influence reproductive functions in women.<sup>3</sup> Abnormal hormone levels have an adverse effect on conception. There is a vicious cycle between psychological distress, reproductive functions and infertility. Adoption is thought to break this vicious cycle, thereby improving general psychological wellbeing among couples. The improvement in the psychological wellbeing may not bring about any change in the structural anomaly in the reproductive system. However, psychological wellbeing is a factor which can disrupt or enhance psychogenic infertility. It may help infertility problems of an unexplained or hormonal nature at least. The results of the study point out that the occurrence of spontaneous conception after adoption is a reality. One can explain the phenomena of spontaneous conception after adoption meaningfully only with the help of psychological dimensions in the case of infertile couples.

Infertile couples experience improved general wellbeing due to positive effects of adoption on the quality of life. The general wellbeing of couples has a clinical perspective and psychological perspective. Clinical perspective defines wellbeing as absence of negative clinical conditions like anxiety and depression which in turn regulate reproductive endocrinology. Psychological perspective is the prevalence of positive attributes. It include some of general characteristics like a positive affect or life satisfaction, personal optimisation, prosocial behaviours, optimism, positive spouse relationships and a balance of attributes in multiple dimensions. Altogether infertile couples as adoptive parents experience positive levels of pleasant emotions. They demonstrate relatively low levels of negative moods.<sup>10</sup>

Spontaneous conception after adoption can be explained in terms of breaking the vicious cycle that exists between stress and infertility. A schematic model is developed to explain spontaneous conception that is observed after adoption in the present study. The schematic model developed based on the findings of the present study to explain spontaneous conception after adoption is given in Figure 2.



**Figure 2.** Schematic Model explaining Spontaneous Conception after Adoption

High quality of life and improved general wellbeing occur among couples as a result of adoption. This in turn results in positive changes in total human physiology related to all systems of the body. It is reported that positive changes in the general endocrine system results in production and regulation and functions of hormones in the following manner. The hypothalamus produces GnRH (Gonadotrophin Releasing Hormones) which stimulates the pituitary gland. The pituitary gland secretes peripheral hormones namely luteinizing hormone and follicle stimulating hormone. This in turn stimulates production of testosterone and estradiol. These hormones control menstrual cycles, ovulation, reproduction and fertilisation.<sup>5</sup> Significant reduction in psychological distress as a result of adoption alters the levels of cortisol, prolactin, and progesterone to an optimum level. A marked reduction of stress corrects hyperprolactinemia which is one common endocrinological abnormality behind infertility. Reduction in stress also rectifies the altered reproductive functions like vaginismus, erectile disorders, and low sexual desire which interfere with conception.<sup>3</sup>

The effect of relaxation and improved general wellbeing could also improve fertility rate in couples with subfertility. Normalisation of reproductive endocrinology and physiology can also result in a favorable outcome of infertility treatment and

continuation of pregnancy after conception. Hence reduction of stress can enhance pregnancy rates, irrespective of subtypes of functional infertility. Many of the infertile couples with functional infertility on failure of treatment modalities are certified as structural infertility for the sake of child adoption. Such couples could be benefited if the psychological component of infertility is taken care of in a better way. Studies to establish correlations between levels of stress and reproductive endocrinology in various phases of infertility treatment are necessary for evidence based conclusions with regard to the findings in the present study. The relationship between levels of stress and reproductive hormones could be done in couples before and after adoption. Estimation of hormonal levels in relation to stress levels may be done in couples with success and failure of infertility treatment. These types of studies are also applicable in evaluating or modifying the effectiveness of counselling packages used for infertility treatment and adoption counselling.

However, more complex mechanisms may be at play and researchers still do not completely understand how exactly stress interacts with the reproductive system. This is a story which is still unfolding and during the last twenty years the new field of psycho neuroimmunology has emerged, which focuses on how mind can affect the body. Research has shown that the brain produces special molecules called neuropeptides, in response to emotions. These peptides can interact with every cell of the body by either degenerating or protecting, including the immune system. In this view the mind and the body are not only connected but also inseparable so that it is hardly surprising that stress can have a negative influence on fertility.<sup>5</sup>

The schematic model (figure 2) proposed in the discussion is helpful in explaining spontaneous conception after adoption. Though the present study do not collect data on psychoneuroimmunology, neuropeptides or reproductive endocrinology, the findings throw light into the role of these factors on subfertility, infertility and management of infertility. It paves way for a new area of research in the field of infertility and spontaneous conception.

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