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It took nature billions of years to establish a state of dynamic equilibrium on earth. Man has taken less than a few hundred years to disrupt this equilibrium, with the consequence that the world is now facing a potentially dangerous situation. The twin problems of exhaustion of non-renewable resources and of an ever increasing population have led to situations which demand rapid remedies if we have to reach a reequilibration point. The only significant solution is to stabilize the population and to reduce its rate of growth. According to a United Nations estimate, by year 2025, the world population will be 8.2 billion and Asia dominated by the two population giants, China and India will account for 55.3% of the world population. Contraception has therefore become a social necessity, especially in developing countries like India where the problem of overpopulation is particularly acute.

Many methods of contraception have been developed and advocated for use from time to time. These include surgical methods of tubal occlusion, intrauterine devices, hormonal contraceptives including implants and oral pills. The recent addition of immunological approaches to fertility control has added a new dimension to contraception development research. "Immunocontraception" is basically a strategy to exploit the inherent traits of recognition, specificity and memory of the immune system to intercept events critical for successful reproduction. Natural cases of infertility linked to immunological causes demonstrate that it is possible to regulate fertility by manipulating the immune system.

Antibodies directed against key molecules, especially hormones, involved in reproductive process have held the attention of reproductive biologists for
developing birth control vaccines (Talwar et al, 1978). The most advanced antifertility vaccine at present is the one conceived to generate antibodies against human chorionic gonadotropin hormone (hCG), a hormone important in establishment and maintainence of early pregnancy (Talwar et al, 1986). Other methods aim at eliciting antibodies against sperm or egg antigens which block sperm-egg interaction, but these are still in the experimental stage (Alexander et al, 1990).

While humoral immunity against reproductive antigens has received due consideration for immunocontraception, the cell mediated immunity in the genital tract has been mostly ignored. Recently, the importance of local cell mediated immunity in the genital tract is being realized as there is growing evidence to show the importance of CMI responses in the success or failure of conception (Anderson and Hill, 1988). It is now recognized that both male and female reproductive tracts are immunologically dynamic environments. However, even repeated exposures to spermatozoa, bearing foreign antigens, through coitus do not elicit an immunological response averse to conception. It is possible that the sperm entry in the female reproductive tract evokes an immune response of suppressive nature. Studies show that the breakdown of such natural immunoprotective mechanisms lead to infertility and recurrent spontaneous abortions in some individuals (Anderson and Hill, 1988). It has been demonstrated experimentally that local immune responses can be elicited, specially in the female reproductive tract, affecting fertility. These observations provide basis for cell mediated immunocontraception as alternate or supplement to present approaches towards birth control vaccines.

In recent years, there has been considerable interest in plants with possible antifertility effect. Although the use of plant products as local contraceptives and
abortificient agents has been practiced in traditional medicine for many centuries, the precise nature and mechanisms of action of these plant products have remained unknown. Neem \textit{(Azadirachta indica)} is one such plant which has been widely used in traditional medicine for a variety of therapeutic purposes (Wealth of India, 1985). Neem oil, also known as oil of Margosa, is extracted from the seeds of \textit{Azadirachta indica}. It has been used traditionally as abortificient agent. Recent studies have confirmed its abortificient effect following post coital application (Sinha \textit{et al}, 1984b; Lal \textit{et al}, 1986; Tewari \textit{et al}, 1986). Neem oil has also been shown to have direct spermicidal effect (Sinha \textit{et al}, 1984a). Extracts from various parts of the neem tree including stem, bark and the root have antibacterial (Singh and Sastry, 1981), antifungal (Chary \textit{et al}, 1984) and antiviral properties (Babbar \textit{et al}, 1982). The antiinflammatory, antipyretic, antitumor and gamma interferon inducing properties of neem oil (Labadie \textit{et al}, 1989) have been found to be due to its modulatory influence on the immune system. Recent studies have further shown that neem oil acts as an immunostimulant; it nonspecifically activates the cell mediated immune mechanisms to elicit an enhanced response to subsequent mitogenic and antigenic challenge (Upadhyay \textit{et al}, 1992). Keeping in mind the reported immunomodulatory properties of neem oil, this work was undertaken with the aim to see if neem oil given locally could override the inherent suppressive mechanisms present in the female reproductive tract and induce a block in fertility. The specific objectives of the study were as follows:

1. To study the antifertility effect of neem oil in female rats following intrauterine application.

2. To study the effect of intrauterine administration of neem oil on the functional morphology of reproductive organs.
3. To study the responsiveness of the uterus to the ovarian hormones following the administration of the oil.

4. To study the involvement of the local immune cell population in the antifertility effect induced by neem oil.