Fertility control has come to the forefront as a topic of global concern, with important medical, social and political considerations due to the population explosion.

A number of contraceptive methods are now available to combat the unchecked rapid growth of population. The different methods have varying degrees of failure rate. Various methods have been developed or are being devised to control population. They include oral contraceptives, paper pills, steroid combinations, copper and medicated IUDs, vaginal rings, with or without steroids, vaginal barrier contraceptives, cervical, vaginal, subdermal implants, sterilizations, immunological methods, nasal sprays, biodegradable implants, antifertility drugs, plant alkaloids, prostaglandins and other abortifacients etc.

The development of an acceptable method of abortion which could be self-administered may not be a distant possibility. This search has however, led to the fascinating investigations with prostaglandins pioneered by Bergstrom and collaborators in the recent years.

India being the second largest country in terms of world population, the problem of population control requires urgent attention. At present, some popular methods of
Fertility control used in our country are surgical sterilization, oral contraceptives, abortion, conventional contraceptives and IUDs, vaginal rings etc., but none of them are safe and cent percent effective and devoid of harmful side effects. Hence, biologists are faced with a herculean task in the search of new contraceptive methods, which should be effective, simple, widely acceptable, cheap and safe to use.

Recently, the effectiveness of administering small doses of steroids by intranasal sprays to block ovulation was reported but not completely satisfactory data were obtained. Nutritional deficiency also plays an important role in reproduction. Malnourished animals showed impaired fertility rate, hence precautions should be taken when effects of contraceptives are tested on undernourished human populations.

The present thesis embodies, studies on the structure and physiology of the ovary and uterus of rats and guinea pigs, under normal and some experimental conditions with the use of contraceptive techniques. A greater emphasis has been given to investigate the metabolic role of ascorbic acid in physiology of mammalian ovary and uterus in the light of recent data from our laboratory. It is known that the free radical of ascorbic acid, monodehydro ascorbic acid (MDHA) is a powerful reductant by virtue of possessing an
The beneficial role of ascorbic acid in restoration of status quo of reproductive tissues under several altered physiological conditions has led to the suggestion, that ascorbic acid be administered for prophylactic treatment of volunteers during and after a particular contraceptive treatment.

On the basis of extensive studies carried out from this laboratory, it has been reported that reproductive tissue metabolism is energized not only by high energy phosphate (\( \sim P \)) but also via the paramagnetic electron flow from MDHA, which has stronger reducing properties than ascorbic acid itself. It was observed that tissues having a high tempo of metabolic activity possessed correspondingly a higher turnover of ascorbic acid. Chapter I is introductory one which includes review of literature. In Chapter II, the materials and methods used are described in details. In Chapter III, the results and observations are given, followed by Chapter IV, wherein, the results obtained have been discussed with respect to the recent data in the particular field. Chapter V, presents the summary of the work done and Chapter VI includes the overall conclusions which could be drawn from the work of the thesis, and also the possible future lines of work which could be undertaken. Lastly the bibliography has been listed in chronological and alphabetic order.
The work included in the thesis revealed for the first time the physiological response of ovary and uterus during different contraceptive treatments with emphasis on the role of ascorbic acid in female reproductive processes under normal as well as stress conditions. It is involved in many oxido-reduction reactions, via involvement of its free radical, hence more energy yield occurs, which maintain the histophysiology of ovary and uterus during and following contraceptive treatments, without interference with the contraceptive purpose of a particular treatment. As such, the present work is a significant contribution to the existing knowledge in the field.

The following abstracts have been published:
