INTRODUCTION

World population growth is a major problem of modern civilization. At present there are 6 billion people in the world and most of them live in developing countries. The rate of population growth is about 1 billion per decade. Studies have shown that about 50% of couples in the reproductive age do not have access or choose not to use modern contraceptive methods. In the female, the available methods include the oral contraceptive pills, injectables, implants, intrauterine devices, cervical caps, diaphragm, female condom and tubal ligation. In the male, the paucity of methods persists. International agencies, national governments, women’s health groups and communities recognize the need and are supporting research and development in contraceptive methods for men (World Health Organization, 1998). We believe that a variety of methods of male contraception will be available in the twenty-first century.

AVAILABLE MALE METHODS

Coitus interruptus and periodic abstinence are termed male methods. In the latter, participation of the female partner is necessary when combined with natural family planning. The acceptance of these methods is very low and failure rates are very high.

Condoms are used by 40 to 50 million men. The typical failure rate is about 15% (Trussel and Kost, 1987). A major advantage of condoms is that they protect against transmission of sexually transmitted disease, a property not shared by any of the male methods under development. Non latex condoms which may be more
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Esthetically pleasing (cause less reduction in sexual pleasure) are yet not widely available.

Vasectomy is a safe and effective method but is offered to couples when the family size is completed. Acceptability of vasectomy varies from country to country. Most of the 45 million men who had vasectomy reside in the United States, United Kingdom, Australia, the Netherlands, China, Korea and Thailand. The failure rate of vasectomy is extremely low but efficacy may be delayed to allow for sufficient time to clear the spermatozoa from the ejaculatory system. Vasectomy acceptance has been improved in many countries with the “no scalpel” surgical method (Li, 1980; Li et al 1991). Intravasal injections of vas occlusive agents, cured-in-place elastomors or silicone have been studied in some countries (China, Indonesia) with variable success rates reported (Li, 1980; Zhao et al 1992, Chen et al, 1992). The major disadvantage of vasectomy is its poor functional reversibility. While reanastomosis of the vas when done by a skilled operator has very high technical success rate (reappearance of spermatozoa in the ejaculate in over 90% of subjects) but pregnancy in the female partner is reported in only about 50% of the couples. This is believed to be due to the development of antisperm antibodies in the reproductive tract and circulation of vasectomized men. If fertility is not achieved after successful vasovasostomy, microsurgical aspiration of spermatozoa from the epididymis followed by in vitro fertilization of the spouse’s eggs by intracytoplasmic injection of spermatozoa and embryo transfer is possible but not available to all (see Chapter 14).

METHODS DIRECTLY ACTING ON THE TESTIS

In the 1970s, gossypol, extracted from cottonseed oil was extensively studied in China. Over 8000 men received gossypol for varying periods of time and essentially all men became azoospermic and infertile. The action of gossypol is directly on the testis, affecting the germ cells without significant action on Leydig cell steroidogenesis. Gossypol works through disruption of oxidative phosphorylation (National Coordinating Group, 1978). The main problem of gossypol is irreversibility which is dose dependent. Permanent sterility occurs in up to 25% of men after using gossypol for a few years (Meng et al, 1988). The other problem is renal loss of potassium resulting in hypokalemia and occasionally hypokalemic periodic paralysis. Moreover, animal toxicological studies in several species including the non-human primate showed additional toxic effects of gossypol (Waites et al, 1998). Other agents that have been studied include sulphasalazine and 3 indazolecarboxylic acids. These agents have multiple actions on cellular events are not testis specific, and may cause irreversible destruction of the germ cells.

Physical agents such as heat have been shown to decrease spermatogenesis in animals and men (Kandeel and Swerdloff, 1988). Germ cells are highly susceptible to the effects of heat. They are protected from the damage that would occur at core body temperature by the location of the testes in the scrotum. In men, when the testes are pushed back in the inguinal canal and held in that position to increase