THE MALE INITIATIVE

The development of a completely reversible contraceptive for men promises to be a trailblazer in the future of birth control

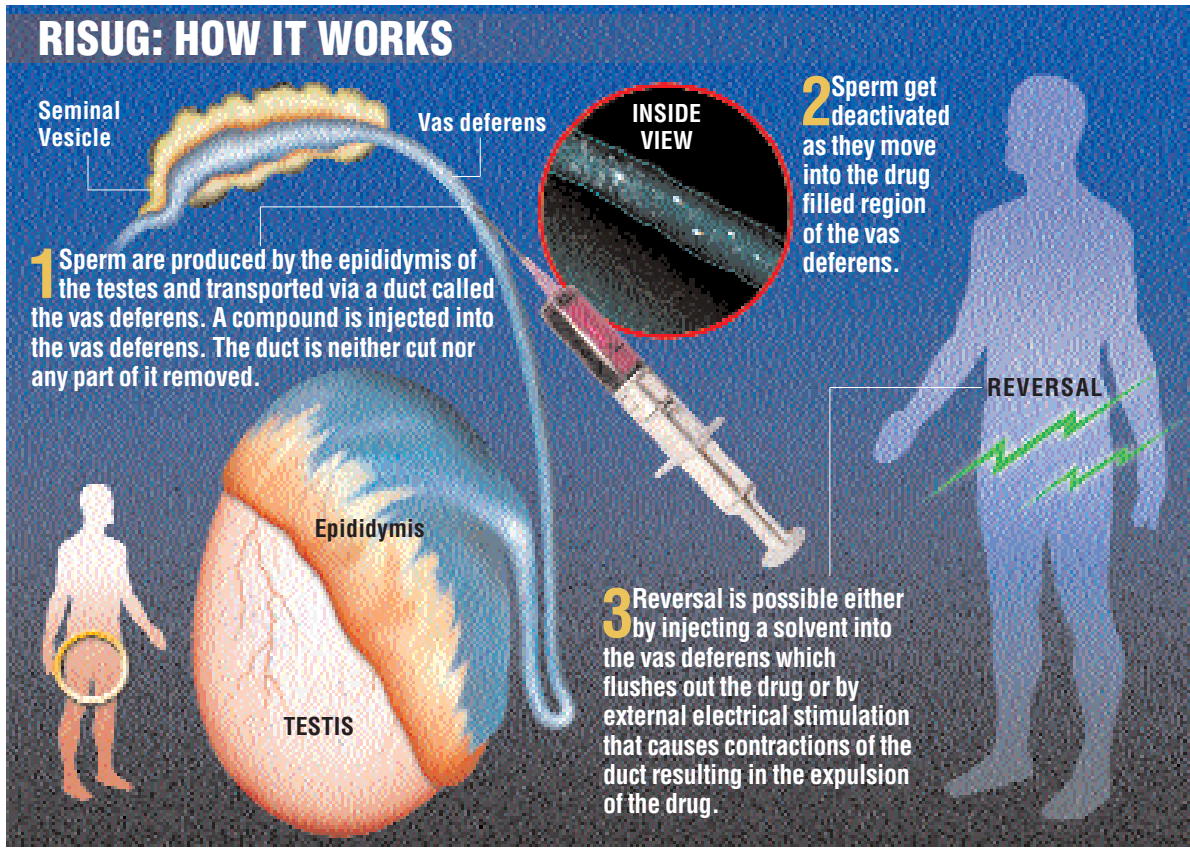
■ by Shefalee VASUDEV

CONTRACEPTION HAS always been seen as a woman's responsibility. Scientific research too has largely been oriented to enhance the basket of contraceptives for women. From traditional options like tubectomy to intra-uterine devices and the "morning after" Pill, all reminded women that it was their problem to see that they did not get pregnant. But what about the men? Even if they were willing to share contraceptive responsibility, they didn't have much choice. There was the condom, which often came up against "psychological resistance", or vasectomy, an almost irreversible surgery. The much discussed male Pill, which is still being researched, will be a hormonal method with its own side-effects. The quest for a safe and convenient male contraceptive with minimal side-effects assumed Nobel Prize proportions as scientists struggled with biology and technology to develop a foolproof solution.

Now it seems as if India may soon come up with an answer. On May 28, Union Health and Family Welfare Minister C.P. Thakur unveiled RISUG—Reversible Inhibition of Sperm Under Guidance—which is the result of 25 years of research done under Dr Sujoy K. Guha, professor of biomedical engineering at the Indian Institute of Technology and the All-India Institute of Medical Sciences in Delhi. Supported by the Ministry of Health and Family Welfare, Guha and a team of experts worked in collaboration with the Indian Council of Medical Research (ICMR) to produce the non-hormonal male contraceptive. RISUG is currently undergoing the final phase of human trials in India and is likely to be available for use by 2003.

The RISUG procedure is simple. The injectible drug is made of two compounds—styrene maleic anhydride (SMA) and dimethyl sulphoxide. A 50 mg dose injected into the vas deferens—the duct that transports semen from the testes—using a special needle and syringe immobilises the sperm in the semen (*see chart*). The drug neither affects the flow of semen nor diminishes the libido. The entire procedure takes about 10 minutes and can be done by any certified medical practitioner. The drug takes effect less than an hour after injection and the effect lasts from six to 15 years depending on the individual.

In conventional vasectomy, the vas deferens is cut and tied to prevent the flow of sperm. So much is the resistance to this method in India that only 2 per cent of all contraceptive surgeries in the country are vasectomies. Also, the procedure is nearly



Graphics by YOGESH CHOUDHARY

Photographs by PRAMOD PUSHKARNA

FOR SCIENCE'S SAKE Deeg Ram with wife Dayawati, one of the first volunteers for the human trials. He took the "no hassles" RISUG injection in 1990.

NO REGRETS Om Prakash, who took the RISUG injection in July last year

irreversible. Even if the vas deferens is rejoined, fertility remains low because the high level of antibodies spawned by the surgery destroys the sperm.

RISUG promises to be different. Its effect can be completely reversed by either injecting a solvent to flush out the drug or using low voltage electrical impulses to cause contractions of the vas deferens to expel the drug. Although reversal trials haven't been conducted on humans yet, Guha says that in rhesus monkeys the efficacy has been 100 per cent.

ALSO, there is no damage to the surrounding tissue. To avoid any pain during injection, a local anaesthetic like xylocaine is used. Although the alkaline dimethyl sulphoxide can cause tissue damage, Guha argues that when used with an acidic compound like SMA, it poses no risk. "Even in case of serious diseases, RISUG will not cause any complications," says Guha.

The journey that culminated in the development of this pathbreaking procedure which may help solve one of the world's biggest problems has not been an easy one. Guha spent close to 12 years researching before the drug was ready even for animal testing. The researchers conducted tests on rats, rabbits, rhesus monkeys and langurs to ascertain its toxicity and safety. The animals were injected doses six to eight times more than the quantity recommended for humans.

After the Drugs Controller of India and the ICMR gave their nod, the first phase of human trials was conducted between 1990 and 1993. In the past 13 years, 220 men aged between 25 and 40 years have undergone the tests. Deeg Ram, an employee of AIIMS and one of the first volunteers for the human trial who took this injection 12 years ago, describes it as a no-hassles procedure. So does Om Prakash, 38, an employee of the LNJP Hospital in Delhi, who took the injection in July 2001.

While volunteers like Om Prakash are convinced that RISUG has no side-effects, the drug may indeed lead to some temporary inconveniences. Doctors say there may be a mild swelling of the scrotum in some cases for a few days after the injection. Besides, there are doubts about the efficacy of the human trials. "It needs several years of intensive clinical trials with a wider sample of the population to really prove that a drug has few side-effects," points out US-based reproductive biologist Dr A.B. Labhsetwar, who is now a banker and supports research on population control in India. "RISUG's beauty is its reversibility but the doctors need to prove that it doesn't cause genetic mutation," he adds.

The RISUG drug has other potential applications in biomedicine. It may be used as a spermicide by women, as a condom jelly and as an anti-bacterial agent to help prevent sexually transmitted diseases as well as AIDS. Family Welfare Department Secretary A.R. Nanda says the RISUG kit, which comprises a 50 mg dose, a needle and a syringe, will be available at government health centres for about Rs 100 per pack. In private clinics, it could be priced at Rs 400. Abroad, it may cost approximately $500 (Rs 24,500).

RISUG may well breathe new life into the Indian Drugs and Pharmaceuticals Limited, the PSU which has signed an agreement with the RISUG team to produce and market the drug. The intellectual property rights belong to India. Besides at home, patents for the drug have already been obtained in Canada, Germany, Malaysia, Thailand and Bangladesh, with China on the verge of finalisation. Foreign pharma majors have shown a keen interest in importing the knowhow.

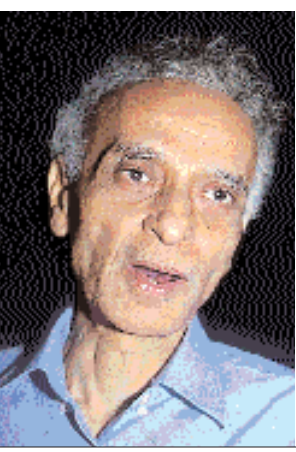
The biomedical optimism apart, RISUG will be successful only if Indian men take their doubts out of their locker rooms into the clinics of doctors. Will men actually take an injection that deactivates their fertility? An injected vas deferens is one thing, but men's choices may be vastly different. ■

THE HUMAN TRIALS

PHASE I: First trials are done to test safety, so only those volunteers were chosen whose wives had already had successful tubectomies.

PHASE II: To test efficacy, those volunteers were chosen whose wives were under 30 years of age and were normal, fertile women who were not using any contraceptives.

PHASE III: Currently under way in India, these trials are similar to Phase II trials but the sample group is much larger.



"The fact that RISUG can be reversed makes the drug very acceptable."
DR SUJOY K. GUHA, inventor of the drug