

Chemical Sterilisation with Quinacrine

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I. INTRODUCTION

Surgical sterilisation is one of the most important methods of fertility control in India. There is a need to study non-surgical methods of tubal occlusion. Several chemical agents are presently being tried in experimental animals but only a few can be used in humans. The ideal chemical should be effective, inexpensive, easily available and easy to administer. Most chemicals used for sterilisation are either sclerosing agents which act by destroying the inner lining of the fallopian tube and causing subsequent fibrosis or agents which solidify within the tube and act by forming a plug and bringing about tissue adhesiveness.

Drugs such as ethanol, formaldehyde and silver nitrate cause tubal **acclusion** but cannot be used because of their toxicity. Silastic S. 5392, S. 521 and inethylene-2-cyanoacrylate (M.C.A.) act by causing tissue adhesiveness. They are highly effective but the process of application has not, so far, been established for these chemicals.

In 1961, Zipper first used quinacrine for blocking the tubal lumen. Quinacrine was used in 800 women; 638 study subjects were observed for 14,677 women months. Five dose schedules and drug combinations were used. Tubal occlusion was reported for 69.0 percent of the cases. The most effective combination was **quinacrine** and xylocaine with or without epinephrine which resulted in tubal occlusion in 94 percent cases after two instillations.¹

Quinacrine ($C_{20}H_{19}ClN_3 \cdot HCl \cdot 2H_2O$) acts by causing granulation of the tubal epithelium by binding the endothelial cells with DNA. It has no action on the endometrial lining. When instilled into the uterus, quinacrine caused

occlusion in rats but not in rabbits. The genital tract of the rabbit has a high concentration of zinc which protects it from damage. Hagenfedt showed that while the human endometrium is rich in zinc the zinc content is much less in the tubal epithelium and so blockage of the tubes occurs following quinacrine instillation.*

II. MATERIALS AND METHODS

Trials with quinacrine were conducted at the **Cama** and **Albless** Hospitals at Bombay under the auspices of the Indian Council of Medical Research. Quinacrine was used in 98 cases. Women with 3 or more living children and **at least** one male child who requested permanent limitation of family size but did not accept surgical sterilisation were included in the study. Women who requested **sterilisation** after medical termination of pregnancy were accepted soon after bleeding stopped and women with lactational amenorrhoea were included within 6 weeks after delivery.

Subjects

All the study subjects were married with proven fertility and in the 22 to **40** years age group. Half of the subjects in the study were Hindus; 45 .0 percent were Muslims and 5 .0 percent were Christians. While 65.0 percent of the women were menstruating regularly, 13.0 percent had lactational amenorrhoea and 13.0 percent were postabortal cases.

Physical examination was conducted to exclude pelvic pathology. Atropine was administered intramuscularly half an hour before the procedure. After cleansing the external genitalia and vagina, a freshly prepared suspension of 1 mg of quinacrine in 3-4 ml was instilled transcervically, very slowly, without using any pressure through a cannula or a No. 8 Foley's catheter. The patient's vital signs were monitored before and after the administration of the drug and pain and reflux were noted. The patient reported for examination after one week. The second dose of quinacrine was instilled after four weeks or following the next menstrual period.

III. RESULTS AND DISCUSSIONS

About 60.0 percent of the women used some contraception during the 6 month period before quinacrine instillation. Oral pills were used by 37.0 percent and injectable or implants by 15 .0 percent of the study subjects. If the patient had an IUD before quinacrine instillation, the drug was instilled with the IUD inside. The duration of contraceptive use varied between 2 months and 5 years.

In this series, 35 women did not use any additional contraceptive after the first instillation; as pregnancies occurred before tubal blockage could be confirmed subsequent cases were provided additional contraceptive methods after quinacrine instillation. The patients continued to use the contraceptive method until blockage

of the tubes was confirmed by hysterosalpingography. While 83.0 percent women used oral pills, 10.0 percent used conventional contraceptives and 40.0 percent used long acting injectables.

Tubal Occlusion Following Quinacrine Instillation :

Bilateral tubal block occurred in 70 (82.3 %) study subjects. Tubal occlusion occurred after two instillations in 65 (76.5 %) cases and after three instillations in 4 cases. In one case tubal block occurred after one instillation only. This woman refused a second instillation but used oral combination pills after the first instillation. Hysterosalpingography was performed 6 months after quinacrine instillation and showed tubal blockage. Three of the four cases who required three instillations had lactational amenorrhoea, they used oral pills as an additional contraceptive.

Side Effects and Complications :

No side effects were observed during or after quinacrine instillation. There was one case of mild pelvic peritonitis and one patient developed a skin rash. Another reported fever and pelvic pain which subsided without any specific treatment. No other complications were observed. Menstrual cycles were regular for most of the women. Zipper reported 2 cases who experienced excitation of central nervous system and were treated with intravenous barbiturates. In his series, amenorrhoea for 3 months was reported in 7 cases; four patients developed intrauterine adhesions and 4 developed chemical vaginitis after quinacrine instillation. Cervical cytology was normal in all cases.

Pregnancies

In this series, 70 women were followed for 680 months. Pregnancies occurred in 2 cases at 2 months and 8 months after tubal occlusion was confirmed by hysterosalpingography. It is interesting to note that there was no spill in the peritoneal cavity. Both were intrauterine pregnancies.

To prevent reflux various cannulae and catheters have been used. The drug was instilled under direct vision via the hysteroscope by Alvarodo and Quinones; their failure rate was, however, very high (62.0 %) and so this method was abandoned.

Reversibility after quinacrine has been tried in animal experiments by the administration of estrogen and progesterone 1 to 28 days after quinacrine instillation.

IV. CONCLUSIONS

Quinacrine sterilisation is a simple method; the drug is inexpensive, the equipment is simple and the method can be used on an out-patient basis. No anaesthesia is necessary and hospitalisation is not required. There is no need for

specialised personnel or sophisticated equipment. If this method proves to be effective it could be popular. Even though the success rate is not as high as with surgical procedures this method of tubal occlusion deserves large scale trials with careful follow-up.

ACKNOWLEDGEMENT

We wish to thank the Superintendent of the **Cama** and **Albless** Hospitals for allowing us to present these data and Dr. K. Jadwani for conducting this study.

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