

**SHORT COMMUNICATION**

**NEEM OIL - A FERTILITY CONTROLLING AGENT IN RHESUS MONKEY**

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**Abstract:** Neem oil, an oil extracted from the seeds of *Azadirachta indica* has been found to act as a good spermicidal agent. Pre and post coital application of the oil intravaginally prevented pregnancy in rhesus monkey.

**Key words:** Neem oil vaginal contraceptive

**INTRODUCTION**

Neem oil is reputed to have many medicinal properties. The oil is also reported for its anti-flagellar action. Our earlier studies have shown that neem oil in its natural form was a potent spermicidal agent (1) and its intra-vaginal application during pre-peri and post implantation period could prevent pregnancy in rats (2). Our findings also suggest that the active compounds of neem were absorbed through the vaginal mucosa into the circulation and thus exerting its antifertility effect (3).

In view of these findings the present study was planned to investigate the pre-coital and post coital effects of neem oil in rhesus monkey and to examine whether progesterone level was affected.

**METHODS**

Fifteen adult, regularly cycling female rhesus monkeys from the Institute's primate colony were divided into three groups of five animals each.

Group A-Pre-Coital; Group B-Post-coital; Group C-Control.

Neem oil extracted from the seeds of *Azadirachta*

*indica* was used. One ml of the oil was administered deep into the vagina using a tuberculin syringe and the pelvic region was kept raised and the syringe is slowly withdrawn so that the oil is properly dispersed in the vaginal vault (4).

In group A (Pre coital group) 1 ml of the oil was applied daily during the days of expected ovulation (9-16). Then the animals were allowed to mate with healthy proven fertile males. Drug application, followed by mating was repeated every day from days 9 to 16 of the cycle and mating was confirmed by taking vaginal smear.

In group B (post-coital group) the animals were allowed to mate during the receptive phase i.e. from days 9 to 16 of the cycle. Neem oil was now applied into the vagina daily from day 17-24 of the cycle, so that the effects of the oil during the period of implantation could be followed. In group C (control) liquid paraffin was administered by the same procedure as in group A and B. Liquid paraffin was chosen because it has almost same viscosity as neem oil & has no spermicidal effects *per-se*. The above mentioned regimen was repeated for three consecutive cycles, leaving aside animals found pregnant. Blood samples were drawn from each animal between days 8 to 23 of the

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cycle. All the samples were drawn between 0900 h and 1100 h. Plasma was stored at - 20 C for progesterone assay by RIA using the reagents supplied by Indian Council of Medical Research, New Delhi (5). The steroid was extracted from the plasma by ether extraction and  $^3\text{H}$ -steroid were used to monitor the recovery. The intra-assay coefficient of variations at different points were 9% where as the interassay coefficient of variations was 9.5% for progesterone. The sensitivity of the assay was 100 pg/ml.

## RESULTS AND DISCUSSION

Table I shows that after vaginal application of neem oil there was no change in body weight and the animals maintained their appetite. The pH of the cervical mucus during receptive phase and the menstrual cycle length were comparable with the control group indicating that neem oil did not act by changing the pH of mucus and neither it affected the cycling pattern.

secretion of progesterone suggesting normal ovulatory pattern.

In group A none of the animals conceived. Vaginal smear taken immediately after confirmed mating did not reveal any motile sperm thus indicating the spermicidal action of the drug which was reported earlier (1).

None of the animals in group B conceived where neem oil applied post coitally. In our earlier studies in rats (3) it was reported that the oil gets absorbed from the vaginal epithelium and reach the endometrium via the general circulation and exert their effect on uterus. The anti-implantation effect could be attributed to a change in bioavailability of hormones which may be due to blocking of the progesterone receptor in the endometrium and thus rendering it incapable of supporting pregnancy.

In control group, three animals out of five became pregnant (60%) which is within the normal

TABLE I : Effect of intravaginal application of Neem oil on cervical mucus characteristics and cycle length.

Group	Subgroup	Body weight (kg)	Cervical mucus characteristics		Rectal temp (°C)	Menstrual cycle length (days)
			Spinbarkeit (cms)	pH		
Group A (Pre-coital)	Basal	5.66±0.23	7.04±0.38	7.21±0.08	38.30±0.06	26.5±1.18
	Experimental	5.71±0.27	6.84±0.26	7.23±0.05	38.40±0.09	25.7±1.11
	Reversibility	6.20±0.20	6.50±0.50	7.32±0.08	38.30±0.03	26.3±1.20
	Basal	5.93±0.20	6.59±0.27	7.16±0.04	38.40±0.06	27.6±0.86
Group B (Post-coital)	Experimental	5.96±0.30	6.52±0.27	7.18±0.05	38.30±0.02	27.2±0.92
	Reversibility	6.33±0.60	6.80±0.21	7.16±0.06	38.26±0.07	26.30±0.33
Group C (Control)	Reversibility	5.78±0.28	7.28±0.18	7.30±0.08	38.30±0.06	27.83±0.83

Values are mean ±SEM, observed during expected ovulation days, n = 5.

Fig. 1 shows that in control as well as neem oil treated group plasma progesterone was less than 1 ng/ml during the luteal phase. The maximum rise and pattern of progesterone in the neem oil treated groups was identical to that of control group, thus local application of the oil did not alter the gonadal

range of fertility of monkeys in captivity. In group A&B, the drug application was stopped after three cycles. In both the groups two animals conceived after first cycle and delivered normal young ones. This indicated that the contraceptive effects of neem oil are reversible thereby eliminating any long term effects of

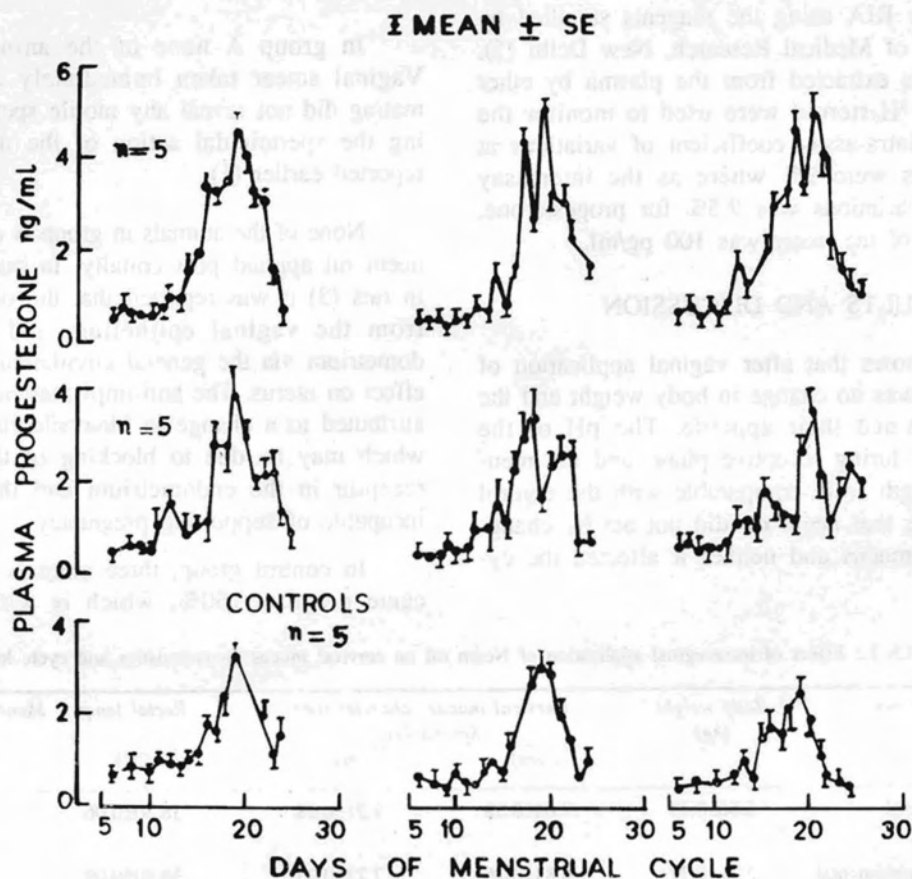


Fig. 1 : Effect of intravaginal application of Neem oil (1 ml) in rhesus monkeys on plasma progesterone level in post-coital, pre-coital and control groups.

the drug on subsequent births once the application of neem oil is stopped.

The present observations clearly indicate that

neem oil on vaginal application acted both as pre-coital as well as post coital contraceptive agent. The menstrual cycle length or progesterone levels were not altered indicating normal ovulatory process.

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