CONTRACEPTIVE EFFECT OF NEEM SEED OIL AND ITS ACTIVE FRACTIONS ON FEMALE ALBINO RABBITS

VIJEYATA VYAS*, ASHOK PUROHIT2
1Department of Zoology, Mahila P.G.College, Jodhpur, Rajasthan, India. 2Department of Zoology, Jay Narain Vyas University, Jodhpur, Rajasthan, India. Email: vijetapaniya456@gmail.com/purohit1411@rediffmail.com.

Received: 28 June 2018, Revised and Accepted: 13 August 2018

ABSTRACT

Objective: In the present investigation, contraceptive efficacy of neem seed oil and its fractions have been examined in female albino rabbits to find out their contraceptive potential.

Methods: The experimental protocol was designed for intact control, Neem seed oil alone and its six active fractions in eight groups for 30 days. The estimation of serum biochemistry, histometry of reproductive organs, and hematological parameters were done.

Results: Oral administration of Neem seed oil alone and its Fraction IV and V causes significant reduction in weight of ovary and uterus which reflects antiestrogenic function of plant material. Significant increase in serum cholesterol and phospholipid in Neem seed oil alone and its Fraction IV and V-treated groups reflects that they may affect the intraovarian estrogen level either by inhibiting the ovarian cell function or by inhibiting follicle-stimulating hormone and luteinizing hormone secretion through hypothalamus-hypophysis axis and impaired estrogen synthesis.

Conclusion: From the ongoing work, it can be concluded that Neem seed oil alone and its Fraction IV and V cause functional sterility in female albino rabbits without causing any side effect on general metabolism.

Keywords: Contraceptive, Histometry, Intraovarian, Hypothalamus.
**Statistical analysis**

All the values of body/organ weights, biochemical estimation, and histometry and follicular numbers were expressed in terms of mean value±standard error. The different groups were compared among each other using Student's t-test [15].

**RESULTS**

**Morphological study**

**Body weight (Figs. 1-2)**

Non-significant changes occurred in body weight of experimental animals of all treatment groups. Administration of Neem seed oil (Group 2) and its chromatographic Fraction IV and V (Group 6-7) brought about significant reduction in the weight of ovary and uterus in relation to control.

**Histometry (Figs. 3-5)**

Histotomy of uterus wall including epithelial cell height and its nuclear diameter shows the shrinkage in the Neem seed oil and its Fraction IV and Fraction V. Similarly, vaginal epithelial cell height and its nuclear diameter also show reduction in Neem seed oil alone (Group 2) and its Fractions IV and V (Group 6-7) treatment groups. The number of mature follicles reduces drastically.

**Hematology**

The hematological parameters such as blood sugar, red blood cells, white blood cells, and hemoglobin concentration of vehicle-treated control (Group 1), neem seed oil (Group 2), Fraction I (Group 3), Fraction 2 (Group 4), Fraction III (Group 5), Fraction IV (Group 6), Fraction V (Group 7), and Fraction VI (Group 8) values were all found in normal range in all treatment groups.

**Serum biochemistry (Figs. 6 and 7)**

The serum biochemistry such as cholesterol, phospholipids of vehicle-treated control, and all other experimented groups was represented in Fig. 6 and 7. The concentration of cholesterol when estimated in Neem seed oil (Group 2), Fraction IV (Group 6), and Fraction V (Group 7)-treated rabbits increased, which was statistically significant (p=0.001) while as in Fraction I, II, III, and VI treated shows no significant changes. Phospholipids concentration also increases in Neem seed oil (Group 2) and Fraction IV and V (Group 6-7)-treated intact rabbits.

**DISCUSSION**

A reduction in the weight of ovary and uterus suggests antiestrogenic nature of Neem seed oil alone and its Fraction IV and V. Isolated fraction of neem seed oil was found to be more effective in comparison...
to Neem seed oil alone and this is due to reduced estrogen level. Histometery of uterus and vagina shows significant reduction in cell height and nuclear diameter in the Neem seed oil alone and its Fraction IV and V. As the functional status of these organs is mainly dependent on estrogen [16,17], whereas in other groups no significant changes were observed. It indicates that Neem seed oil and its Fraction IV and V may have antiestrogenic nature [18,19]. The essential prerequisite in the process of ovulation is complex sequence of hormonal events there includes timed preovulatory rise of threshold levels of estradiol followed by an ovulatory luteinizing hormone (LH) peak and subsequent rise in progesterone [20-22]. During the initial development, the ovarian follicles cells produce estrogen, and during the latter stage under the influence of LH, they produce progesterone [23,24]. Since the maturation of follicles has been affected by Neem seed oil and its Fraction IV and V. In the all above three treatment groups, the number of follicles reduces drastically which reflects inhibitory function of neem seed oil and its Fraction IV and V. Similarly, the increased level of serum cholesterol may show the antiestrogenic nature of plant material because cholesterol is an important precursor in synthesis of steroid hormones [25-28]. The specific function of cholesterol in the ovary is to act as precursor molecule for synthesis of estrogen [29] so the increased level is due to non-utilization of contraceptive due to inhibitory ovary function so it is confirmed that Neem seed oil alone and its Fraction IV and V may affect the intraovarian estrogen level either by inhibiting the ovarian cell function or by inhibiting follicle-stimulating hormone and LH secretion through hypothalamus-hypophysis axis, and impaired estrogen synthesis has been achieved resulting infertility. Hematology and serum study shows that Neem seed oil and its all fractions have no toxic effect on general metabolism.

CONCLUSION
From the ongoing work, it can be concluded that neem seed oil alone and its Fraction IV and V cause functional sterility in female albino rabbits without causing any side effect on general metabolism.

ACKNOWLEDGMENT
We would like to acknowledge Head, Department of Zoology, Jai Narain Vyas University, Jodhpur, and Rajasthan, for providing all facilities.

AUTHORS’ CONTRIBUTIONS
The complete research work was suggested and mentored by Prof. Ashok Purohit. All the experimental works were performed by Vijeyata Vyas. Author drafted and approved the final manuscript.

CONFLICTS OF INTEREST
The authors declare that they have no conflicts of interest.

REFERENCES
16. Yadav R, Jam GC. Antifertility effect and hormonal profile of petroleum