INTRODUCTION
Although rapid progress has been made in improving fertility in women, the treatment of an infertile male has remained very unsatisfactory. This situation is partly due to paucity of our knowledge regarding the factors controlling spermatogenesis in man. The role of testosterone and gonadotropins in the maintenance of spermatogenesis is not clearly understood (Steinberger, 1971). No consistent improvement in the functions of the testis and the accessory reproductive organs has been reported on administration of testosterone, gonadotropins or clomiphene to infertile men (Zarate et al., 1973).

Several reports have appeared recently indicating the beneficial effect of a non-hormonal preparation, Speman (Himalaya), on the gametogenic as well as on the androgenic functions of the testes in man (Bhatnagar, 1973; Khaleeluddin, 1973; Kunaiah, 1966; Mukherjee, 1973; Subbarao, 1973). However, the mode of action of the drug on the functions of the testes and the accessory reproductive organs has not been studied so far. The purpose of the present study was to further elucidate the effects of Speman on the spermatogenic and androgenic functions of the testes. Also, a study was made of the action of the drug on the levels of circulating gonadotropins.

MATERIAL AND METHODS
In an earlier pilot study, Speman was administered in the dose of two tablets three times a day for 3 months to 8 infertile oligospermic subjects. The sperm count and sperm motility of these subjects, before and after the completion of therapy, is indicated in Fig. 1.

In the present series, twenty-one infertile oligospermic patients in the age group 25-35 years were taken up for the study. After physical examination, the subjects were administered Speman tablets in the dose of 2 tablets 3 times a day for four weeks. Ejaculates were collected by masturbation after a three-day period of sexual continence. Semen and blood samples were collected immediately before starting and soon after the completion of therapy. All samples were collected between 9.00 and 10.00 a.m.
The composition of the indigenous drug Speman is given below:

Each tablet contains:

- Orchis mascula (Salap misri) 65 mg
- Lactuca scariola (Kahu) 16 mg
- Hygrophila spinosa (Talmakhana) 32 mg
- Mucuna pruriens (Kavach) 16 mg
- Exts. Parmelia parlata (Chharila) 32 mg
  - Argyreia speciosa (Vridhadharaka) 32 mg
  - Tribulus terrestris (Gokhru) 32 mg
  - Leptadenia reticulata (Jivanti) 32 mg
- Suvarnavang (Mosaic gold) 16 mg
- Excipients q.s.

Soon after the liquefaction of the semen an aliquot was taken out for routine semen analysis and the remaining sample was centrifuged at 0°C for 20 minutes. The seminal plasma thus obtained was stored in aliquots at –20°C till the biochemical estimations were carried out. The sperm concentration and motility were determined using haemocytometer. Acid phosphatase activity in seminal plasma was determined according to the method of Bessey et al. (1946). Maltase activity was determined by the glucose oxidase method (Rao et al., 1969). Citric acid was estimated according to the procedure of Beutler and Yeh (1959). Paper chromatographic procedure of Sheth and Rao (1959) was utilised for fructose estimation. Glycogen was determined according to the method of Haltman (1967). The concentration of α-amylase was assayed according to the method of Noelting and Bernfeld (1948). Protein content was estimated according to Lowry et al (1951).

The double antibody radio immunoassay technique (Midgley, 1966) has been employed for assaying serum FSH, LH and prolactin. Reference preparation used for FSH, LH and prolactin radio immunoassays were IR-HMG supplied by W.H.O. and Human Prolactin (VLS) supplied by N.I.H. The lower limit of sensitivity for FSH and LH were 7 MIU and 4 MIU per ml of serum respectively and 1 ng/ml for prolactin assay. All the samples were analysed at the same time.

RESULTS

An earlier pilot study showed a significant improvement in the sperm concentration and motility following treatment with Speman for 3 months (Fig. 1).

In the present study, following alterations in the constituents of seminal plasma were observed after the administration of Speman. Of the 18 infertile men studied, 50% of the subjects showed improvement of their prostatic function as assessed by the activity of maltase and by the citric acid content; in the remaining patients, no change was noticed. Along with the increase in the activity of enzymes, viz. amylose and maltase, which are involved in glycogen degradation, a significant \( p<0.001 \) decrease in the post-treatment levels of glycogen in seminal plasma was found in 70% of the treated cases. Acid phosphatase activity did not show consistent pattern following Speman therapy.

No marked change was observed in the seminal vesicular function due to the Speman treatment. The fructose concentration of the seminal plasma was unaltered in nearly 60% of the subjects who completed Speman therapy.

The serum values of follicle stimulating hormone (FSH), luteinizing hormone (LH) and prolactin (hPrl) did not show marked changes due to Speman therapy (Table 1).

<p>| Table 1: Serum FSH, LH and prolactin values before and after 4 week Speman therapy |</p>
<table>
<thead>
<tr>
<th></th>
<th>FSH m.I.U./ml</th>
<th>LH m.I.U./ml</th>
<th>Prolactin mg./ml</th>
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<tbody>
<tr>
<td>B</td>
<td>36.78 ± 8.88</td>
<td>27.00 ± 2.19</td>
<td>27.58 ± 5.69</td>
</tr>
<tr>
<td>A</td>
<td>27.73 ± 7.52</td>
<td>27.63 ± 3.16</td>
<td>24.10 ± 4.39</td>
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</tbody>
</table>

Values expressed as mean ± S.E.
B – Before treatment
A – After treatment

**DISCUSSION**

The clinical use of Speman in the treatment of oligospermic males has been well documented (Bhatnagar, 1973; Khaleeluddin et al. 1973; Kunaiah, 1966; Mukherjee, 1973). These reports pertaining to the clinical evaluation of this indigenous drug showed increase in the sperm count and sperm motility of nearly 60% of the patients after the completion of the treatment.

The results from the present study indicate that there is an increase in the secretory function of the prostate. Of the various parameters studied, the increase in the citric acid content and the enhanced activity of maltase with increase in the degradation of glycogen in seminal plasma indicate that the drug Speman has ‘androgen like’ action on the prostatic function. Acid phosphatase activity, however, was not significantly altered in this study following Speman therapy. This prostatic enzyme has also been shown to be androgen dependent (Hanson, 1949; Kent, et al. 1969; Kirk et al. 1952).

Thakur and associates (1975) have demonstrated that in man the seminal vesicles are less sensitive to androgen treatment. This might explain the unaltered fructose values in nearly 60% of the subjects who were treated with Speman.

The results showed that the serum values of FSH, LH and prolactin were not altered. The mechanism by which the drug results in improvement of spermatogenesis in human subjects without affecting pituitary function, however, remains to be elucidated.

**SUMMARY**

The effects of Speman on spermatogenic and androgenic functions of the human testes were studied. As initial pilot study showed improvement in sperm count and sperm motility when Speman tablets were administered for 3 months. A further study showed increase in prostatic function and glycogen metabolism of seminal plasma following Speman therapy for 4 weeks. The androgenic properties of Speman may be beneficially utilised in the treatment of infertile oligospermic men.

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**REFERENCES**

