Testicular Changes in Electroshock-Induced Stress and Effect of Speman

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ABSTRACT
Twelve male adult rats of Charles Foster strain were given electric shock daily for 15 days. A marked decrease in organ weight and sperm count were recorded. Oral administration of an indigenous drug Speman prevented decrease in organ weights. Sperm count was marginally increased. Stress-induced vasoconstrictions may be the cause of testicular damage and Speman may prevent this by reducing testicular vasoconstriction or reducing the effect of anoxaemia or both. Speman is not an anti-stress agent. Hence, Speman may be used to increase male fertility.

INTRODUCTION
Stress is considered a major factor contributing to male infertility. Decreased gonadal response following stress was reported by Armario et al., in 1984. Several workers noted that stress significantly reduced sperm count and motility (Bents, 1985; Moghissi, 1983). Giralt et al. (1987) showed marked changes in the male reproductive organs following ACTH administration. Earlier Cockett (1970) reported significant reduction in male fertility following immobilization stress in non-human primates.

Khaleeluddin (1973) reported favourable results of treatment with Speman in men with oligospermia. Jayatilak (1976) reported improvement in accessory reproductive function in mice after treatment with Speman. Pardanani (1976) studied the effect of Speman on semen quality of oligospermic men and reported favourable results. Speman is a proprietary formulation of drugs reputed to improve reproductive function and so reported in Ayurvedic literature. It was therefore decided to evaluate the effect of stress on testicular function and modification by Speman, if any.

MATERIALS AND METHODS
Eighteen male rats (Charles Foster strain) weighing 200-300 gm were used. They were fed a standard, synthetic diet (Hindustan Lever). Water was allowed ad libitum. They were housed in constant temperature rooms at 22 ± 2°C. The animals were divided into the following three groups of 6 rats each:

Group I - Control
Group II - Animals subjected to electric shock stress
Group III - Animals subjected to electric shock stress and given Speman.

Electric shock stress was induced by applying electric current of 90 m Volts for 0.2 seconds daily for 15 days through the temporal region.

Speman was given orally as suspension in the dose of 100 mg per day for 15 days.

On the 15th day the animals were sacrificed and weights of their testes, epididymis and adrenal glands were noted. Semen was collected from the epididymis for sperm count.

Two animals were subjected to microangiographic study by the method of Rai (1970). In this, a 50% suspension of radio-opaque dye is perfused through the abdominal aorta and blood drained from the vena cava. The testes were later subjected to radiography and also to histopathological study.

RESULTS
The accompanying table shows the changes in weights of the testes, epididymis and adrenals in stressed animals, and stressed animals treated with Speman, compared to control animals. There is a significant reduction in the weights of testes and epididymis in stressed rats (Group II), which is prevented by Speman treatment. The adrenal glands weight is significantly and markedly increased in stressed animals as expected (Group II) and also in stressed animals treated with Speman, indicating that Speman is not an anti-stress agent. The microangiographic studies show fine normal vasculature of the testes in control rats (Fig. 1a) and poor vascularity in stressed animals (Fig. 1b). Stressed animals treated with Speman (Group III) show slight improvement in vasculature (Fig. 1c), but microvascular picture of the testes shows considerable opening of vessels in this group (Fig. 2c) compared to stressed animals (Fig. 2b). The sperm count is suppressed in stressed animals (Table) and shows only slight improvement in stressed animals treated with Speman (Group III).

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weights (mean of two)</th>
<th>Sperm count (mean of two)</th>
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<tbody>
<tr>
<td></td>
<td>Epididymis (mg)</td>
<td>Testes (g)</td>
</tr>
<tr>
<td>Group I – Control (6)</td>
<td>525 ± 21.6</td>
<td>1.095 ± 0.024</td>
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<tr>
<td>Group II – Shock stress (6)</td>
<td>392 ± 27.8</td>
<td>0.991 ± 0.08</td>
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<tr>
<td>Group III – Shock stress + Speman (6)</td>
<td>499 ± 60.0</td>
<td>1.15 ± 0.09</td>
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DISCUSSION
Electric shock-induced stress produced the expected increase in adrenal gland weights. It also produced marked vasoconstriction in the testes as clearly seen in the study of the microvasculature (Fig.2 b). The reduced weight of the testes and epididymis is likely to be due to consequent ischaemia, which also reduces the sperm count. Speman treatment prevents weight reduction of the testes and epididymis. The vasoconstriction is also reduced but
adrenal gland weights are not affected indicating that Speman has a specific effect on the testes and is not an anti-stress agent. The sperm count does not show appreciable increase but this may be due to the fact that Speman was given simultaneously with stress, so that the effects in the initial few days may not have been appreciable and regeneration of germinal epithelium takes a longer time to reflect in the sperm count. Reduced damage to germinal epithelium is clearly seen in the histological picture of the testes (Fig. 3 c). Thus Speman appears to protect the testes against stress-induced damage.
REFERENCES


