CHAPTER FIVE
VAS DEFERENCE

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Vas deferens

5.1. Review of literature :

Study of available literature reveals that there exists very little work on record regarding the effects of antifertility agents (chemical compounds and plants) on vas deferens.

5.1.1. Chemicals :

Chinoy and Chinoy (1979) administered cyproterone acetate and reported decrease in wet weight of Vas deferens. Administration of 2 - mercaptopropionyl glycine (MGP) for 60 days to male rats caused decrease in wet weight of Vas deferens, and changes in the structure and secretary activity of epithelium (Rao et al., 1986).

5.1.2. Plant Preparations :

Plumbagin (an active principle from Plumbago zeylenica) when administered to dogs caused lumen of Vas deferens devoid of sperms (Bhargava, 1984). Oscimum sanctum leaves extract when fed to albino rats for long time, reduced the sperm count and motility in the fluid of vas deference (Khanna et al.,1986).

Plumbagin treatment resulted in degeneration of mucosal folds, the epithelium with intense eosinophilia, reduction in the height of stereocilia and presence of cellular debris in lumen of vas deferens of albino rats (Jadhav, 1988). Rao (1988) administered Solanum xanthocarpum seed extract to white rats and found decrease in weight and regressive changes in vas deferens. Chinoy et al., (1988) administered Vinca rosea albino rats and reported many histological alteration in vas deferens. In rats Piper betle petiole extract treatment showed decrease in epithelial cell height of Vas deferens (Hiremath, 1988).

5.2. OBSERVATIONS :

5.2.1. Alterations in wet weights of the vas deferens :

The alterations occurring in the wet weights of vas deferens of control and experimental rats are recorded in Table No. 6 and illustrated in Graph No. 6.

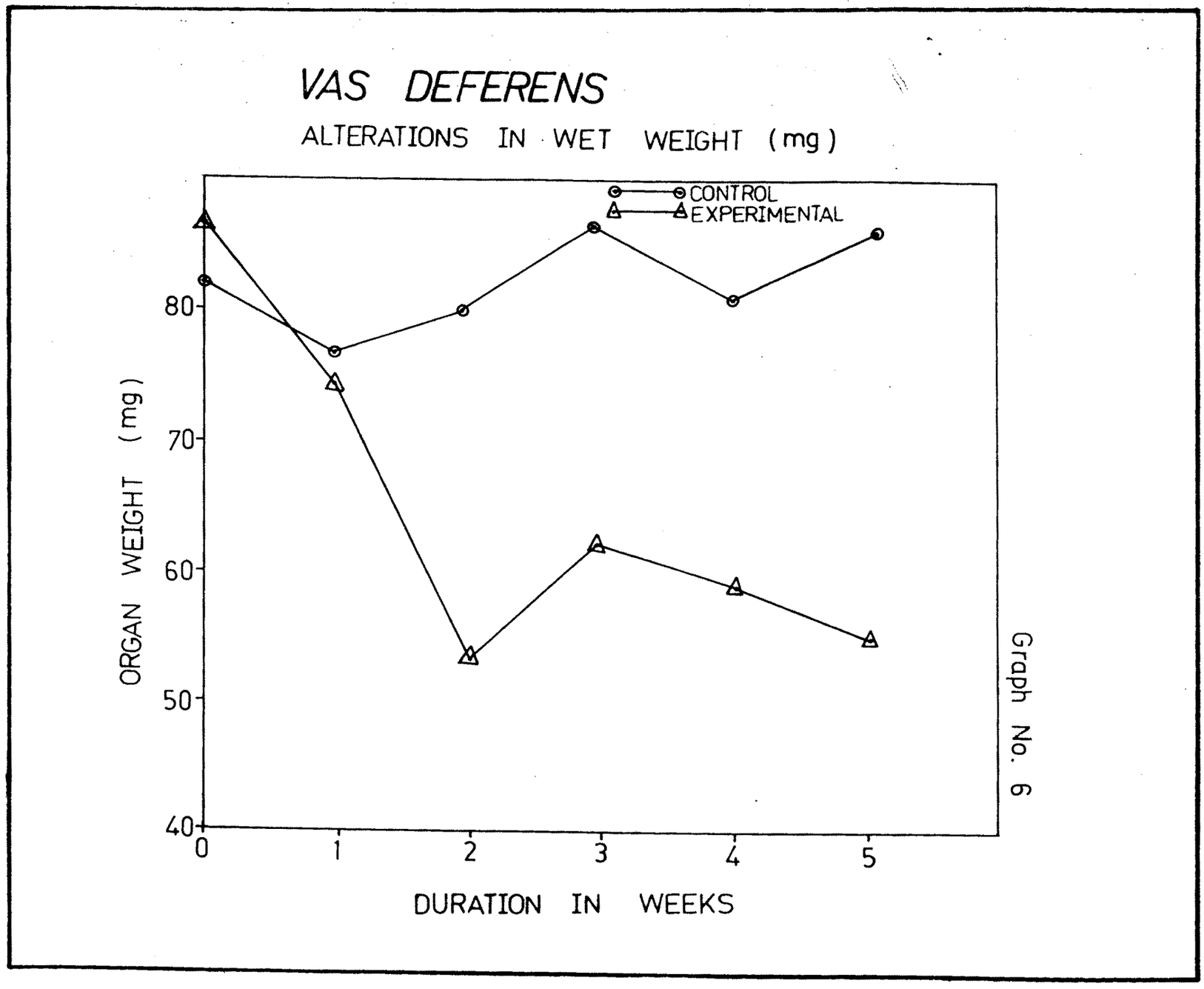
Table No. 6 : Vas deferens : Agnus castus extract induced alterations in wet weights.

Duration in weeks	Control wt. of Vas deferens(mg)	Experimental wt. of Vas deferens (mg)
0	82 ± 5.2	87 ± 6.8
1	77 ± 4.7	74 ± 4.7
2	80 ± 5.8	53 ± 3.8
3	87 ± 6.4	62 ± 4.5
4	81 ± 5.7	59 ± 4.8
5	86 ± 6.6	55 ± 3.7

(Values are mean ± S.D. of three animals and are expressed in mg/100 g. of body weight).

As seen from the tabular and graphical illustrations the weights of vas deferens remained fairly constant in control rats which received only vehicle. But in the rats receiving Agnus castus extract, the wet weights of vas deferens decreased as a function of duration of the treatment.

Initially the wet weights of vas deferens of control rat was 82 ± 5.2 mg/100 g. of body weight. It showed minor


VAS DEFERENS
ALTERATIONS IN WET WEIGHT (mg)
CONTROL
EXPERIMENTAL
ORGAN WEIGHT (mg)
80
70
60
50
40
0
1
2
3
4
5
DURATION IN WEEKS
Graph No. 6

variations to 77 ± 4.7 mg, 80 ± 5.8 mg, 87 ± 6.4, 81 ± 5.7 mg. and 86 ± 6.6 mg/100 g. of body weight after 1st, 2nd, 3rd 4th and 5th weeks respectively.

In experimental rats, the weight of vas deferens was 87 ± 6.8 mg/100 g. of body weight, at the commencement of the treatment. It showed depletion to 74 ± 4.7 mg and 53 ± 3.8 mg. after 1st and 2nd week of treatment respectively. It rose to 62 ± 4.5 mg after 3rd week of the treatment. The values depleted again to 59 ± 4.8 mg and 55 ± 3.7 mg/100 g. of body weight respectively.

5.2.2. Alteration in Histology :

Control :

Vas deferens consisted of three layers namely adventia, muscularis and mucosa and centrally enclosed lumina. This structure did not differ from the normal (Plate No. 4, Fig. 1).

i) Adventia :

It is a covering of vas deferens. It is a coat of fibrous connective tissue containing numerous blood vessels, nerves and often scattered bundles of smooth suscle fibres.

It merges without definite demarcation with the surrounding connective tissue.

ii) Muscularis :

It is a three layered muscular coat an inner longitudinal, middle circular and outer longitudinal. The middle and outer coats are strongly developed. The inner longitudinal layer is comparatively thin. The muscle layer consists of spirally oriented smooth muscles.

iii) Mucosa :

The mucosa is lined by pseudostratified columnar epithelium. The stereocilia show a variable distribution being absent in some cells and present in others. The epithelium is surrounded by a connective tissue. The mucosa is thrown into several longitudinal folds, hence in the transverse section lumen appeared star shaped.

iv) Luminal contents :

Lumen of vas deferens is comparatively small and is full of sperms and secretion.

Experimental :

As stated earlier, the entire period of Agnus extract treatment is divided into two phases.

I) First phase of treatment :

i) Adventia :

There was no change in the adventia.

ii) Muscularis :

There was no apparent in the muscular coat. It remained thick and normal as in the control.

iii) Mucosa :

Decrease in the height of epithelial folds was evident. Slight reduction in length of stereocilia also seen.

iv) Luminal contents :

Lumen appeared to be widened. Slight decrease in sperms and secretion was seen.

II) Second phase of treatment :

i) Adventia :

It remained unaltered.

ii) Muscularis :

Circular muscle layer showed appreciable reduction.

iii) Mucosa :

The mucosal folds decreased in height as a result of which diameter was increased. Mucosal epithelium was detached from lamina propria at certain places.

iv) Luminal contents :

The luminal region got widened. It contained cellular debris with broken fragments, remnants of cells which were sloughed off from the testis (Plate No. 4, Fig. 2).

5.3. DISCUSSION :

In the present discussion Agnus castus extract induced alterations in the wet weight and histological structure of vas deferens of albino rats are discussed. Not much attention seems to have been given to vas deferens in studies involving effects of aspermatogenic agents, both chemical and plants in origin. There exists very little literature on this aspect. We have more or less complete information about the extract induced alterations in vas deferens. These alterations are

proposed to be discussed at a comparative level with the available literature on the changes in vas deferens induced by chemical compounds and various plant extracts and to arrive at definite conclusion.

In the present investigation it is observed that there is a decrease in wet weight of vas deferens due to administration of Agnus castus extract. Similar decrease in the wet weights was observed after administration of chemical compounds These include cyproterone acetate (Chinoy and Chinoy, 1979), 2 - Mercaptopropionyl glycine (Rao et al., 1986), removal of epididymal fat (Shriniwasan, 1988), methyl mercuric chloride (Vachhrajani et al., 1988). Similar decrease in wet weight of vas deferens was also observed with plant preparations such as Oscimum sanctum (Khanna et al., 1986), Plumbagin (Jadhav, 1988), Piper betle (Hiremath, 1988) and Solanum xanthocarpum (Rao, 1988)

In the present studies mucosa of vas deferens showed decrease in height of the epithelial cells and stereocilia also reduced. This finding resembles with the observations made with administration of 2 - mercaptopropionyl glycine (Rao et al., 1986), Piper betle (Hiremath, 1988) and plumbagin (Jadhav, 1988).

In the present investigation decrease in the mucosal folds, widening of lumen containg large number of broken fragments and cellular components which are sloughed off from the testes and ultimately absence of normal spermatozoa are seen in the vas deferens due to Agnus treatment. Similar changes were noted with Cyproterone acetate (Chinoy and Chinoy, 1979), 2 - mercaptopropionyl glycine (Rao et al., 1986), Oscimum sanctum (Khanna et al., 1986), plumbagin (Jadhav, 1988), Vinca rosea (Chinoy et al., 1988), Solanum xanthocarpum (Rao et al., 1988), Piper betle (Hiremath, 1988).