PATHOLOGICAL EVALUATION OF ANTI-TUMOUR EFFECT OF CURCUMIN AGAINST EXPERIMENTALLY INDUCED MAMMARY TUMOUR IN RATS

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CERTIFICATE

This is to certify that the thesis entitled **"PATHOLOGICAL EVALUATION OF ANTI-TUMOUR EFFECT OF CURCUMIN AGAINST EXPERIMENTALLY INDUCED MAMMARY TUMOUR IN RATS"** submitted in partial fulfilment of the requirement for the degree of **Master of Veterinary Science in Veterinary Pathology** to the Tamil Nadu Veterinary and Animal Sciences University, Chennai - 51 is a record of bonafide research work carried out by **P. JALANTHA** under my guidance and that no part of the thesis has been submitted for the award of any other degree, diploma, fellowship or other similar titles or prizes and that the work has not been published in part or full in any scientific or popular journal or magazine.

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ABSTRACT

PATHOLOGICAL EVALUATION OF ANTI-TUMOUR EFFECT OF CURCUMIN AGAINST EXPERIMENTALLY INDUCED MAMMARY TUMOUR IN RATS

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The present study was conducted to find out antitumour effect of curcumin in DMBA induced mammary tumours in Sprague-Dawley rats. Eighteen each rats were randomly distributed to the control, DMBA, tamoxifen and curcumin groups.

Piloerection was noticed after administration of DMBA. Significant ($P<0.05$) decrease in the body weight gain was observed from 3rd week of experimentation in the tamoxifen treated rats, 13th week of experimentation in the DMBA group and except 7th, 9th and 11th week of experimentation in the curcumin treated rats when compared to the control group. Significant ($P<0.05$) decrease in the feed consumption was observed in all treated groups when compared to the control group.

First mammary tumour appeared on 28th day after first dosing in the DMBA and tamoxifen fed rats while it was found in a rat at 56th day in the curcumin treated group. The first tumour occurrence stopped by 82nd day in the curcumin group whereas it was extended up to 91st day in the tamoxifen group and till the end of experimentation in the DMBA group. In the DMBA group, 15/16 rats (94%) showed development of mammary tumours (n=32) and in the tamoxifen group, 5/13 rats (38%) developed mammary tumours (n=10), while in the curcumin group, 4/16 rats (25%) developed mammary tumours (n=8).

In the DMBA treated group, the mammary tumours developed in the cervical (n=1), thoracic (n=18), abdominal (n=12) and inguinal (n=1) glands. In the tamoxifen group, the mammary tumours originated from the thoracic (n=8), abdominal (n=1) and inguinal (n=1) glands. In the curcumin treated rats, the mammary tumours developed in the thoracic (n=6) and abdominal (n=2) glands. In the DMBA group, 18/32 tumours developed in the thoracic glands (56.25%). No tumours were found in the cervical glands of the tamoxifen fed rats and cervical and inguinal glands of the curcumin treated rats.

In the DMBA group, seven rats developed single mammary tumour, four rats developed two tumours each, two rats developed three tumours each and one each rat developed five and six tumours. Five tamoxifen treated rats developed two mammary tumours each. In the curcumin treated rats, one each rat developed one and three tumours and two rats developed two mammary tumours each.

In the DMBA group, 9/15 animals developed 23 mammary carcinomas (72%; N=32) and six rats developed 9 benign tumours. In the tamoxifen treated group, 3/5 animals developed six carcinomas (60%; N=10) and two animals developed 4 benign tumours and in the curcumin group, 2/4 animals developed five carcinomas (63%; N=8) and two animals developed three benign tumours.

In the curcumin treatment group, DMBA tumours found were well differentiated low grade carcinomas when compared to the DMBA and tamoxifen groups. ERα expression was found in the benign tumours.

The study revealed that curcumin could prevent the development of mammary tumours (25%) to the extent of 69 and 13 per cent when compared to the DMBA (94%) and tamoxifen (38%) groups. Further, the latency period was extended by 28 days more than that of DMBA and tamoxifen groups. The curcumin treatment not only prevented the occurrence of mammary tumours but also the number of tumours in the affected animals and per cent carcinomas. Besides, the dosage used was also lower than the previous report and admininstered at weekly intervals than daily doses.

Hence, it can be concluded that curcumin could be considered as an alternative or additional therapeutic agent in the anticancer therapeutic regimen of mammary tumours.

Key words: Curcumin – DMBA – Mammary tumours – Rats – Tamoxifen