ENDOCRINE BACKGROUND AND CONSEQUENCES OF TESTICULAR TUMOUR IN DOG

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Introduction: Primary testicular tumours and tumours due to cryptorchidism are the most common tumours affecting the male genital organs in dog. Major types of testicular tumours on basis of WHO classification are the sex-cord stromal tumours, namely Sertoli cell tumour, Leydig cell tumour and granulosa cell tumour. Seminoma as germ cell tumour occur with approximately probably equal frequency and tumours growing from interstitial tissue. Hormone secretion of tumour depends on the cell origin of tumorous transformation and enzymatic degradation of steroids, respectively. Metabolism of steroids is an enzyme dependent pathway which is moved from cholesterol through different steroids included testosterone to oestradiol as final molecule.

Materials and Methods: Thirty three dogs suffered from testicular tumour (21 cryptorchid, 12 scrotal localisation) and ten healthy male and eleven female as control were castrated and spayed. Serum sample was collected before induction of anaesthesia. Serum samples were kept at -20°C until measurement. Pregnenolone, corticosterone, cortisol, 17α-OHP, testosterone and 17β-oestradiol were measured by ELISA kit (DRG) (Diagnostic Systems Laboratories, Inc. Webster, USA) and progesterone (Quanticheck) (Veterinorg Ltd, Budapest, Hungary). A 1x1 cm size cubic tissue samples were fixed in 4% buffered formaldehyde solution after the removal of testicle. The histopathologic diagnosis was based on haematoxylin and eosin stain and the sections were immunostained using the EnVision System. Anti-PCNA antibody, anti-MMP9 antibody, anti-caspase 3 antibody, anti-estrogen receptor α antibody, anti-EGF antibody, anti-PGP antibody, anti-survivin antibody was used in immunohistochemical reaction, all of them is the product of Abcam (Cambridge, UK).

Results: Beside the normal testicles, seminoma, granulosa cell tumour, Sertoli cell tumour and Leydig cell tumour were diagnosed. Spermatogonia of normal testis were PCNA positive. In seminoma, where tumour cells, especially the larger size cells were positive in contrast with spermatogonia in convoluted seminiferous tubules around the tumour. Although Sertoli cell tumour and granulosa cell tumour were PCNA positive, primary spermatocytes in intact seminiferous tubules beside the tumours were positive exclusively at Sertoli cell tumour cases. Presence of ER was confirmed in spermatids of normal testicles, in Sertoli cell tumour and seminoma. Serum hormone concentrations of tumorous (mean±SD) were: pregnenolone 19.89±12.96 ng/mL; P₄ 2.23±1.33 ng/mL; corticosterone 94.35±65.58 nmol/L; 17α-OHP 0.96±0.66 ng/mL; cortisol 136.54±84.09 nmol/L; testosterone 9.15±5.54 ng/mL; 17β-oestradiol 69.17±48.37 pg/mL. Serum hormone concentrations of controls (mean±SD) were: pregnenolone 20.82±13.26 ng/mL; P₄ 5.38±5.35 ng/mL; corticosterone 88.78±67.91 nmol/L; 17α-OHP 0.98±0.65 ng/mL; cortisol 134.02±91.15 nmol/L; testosterone 8.73±4.70 ng/mL; 17β-oestradiol 56.66±40.88 pg/mL. Although the serum testosterone level differed in patients suffered from different testicular tumour, the serum oestrogen level was not different at the level of significance.

Conclusion. PCNA positivity was detected in cells with high proliferating activity, Sertoli cell tumour seems to have negative effect on cytogen function of identical non-tumorous testis tissue. ER expression confirm the complex role of sexual steroids.