Immunohistochemical identification method of tumour cells in the S phase of mitotic cycle and its usefulness in diagnostics of mammary gland adenocarcinomas in bitches

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Abstract

The studies aimed at identification of neoplastic cells at the S phase of mitotic cycle in mammary gland adenocarcinomas of bitches. The material was sampled from bitches of various races, aging 6 to 12 years, in which the mammary gland tumours developed spontaneously. The tumours were verified histopathologically and, then, immunohistochemical reactions were performed in order to detect cells which had incorporated BrdU (bromodeoxyuridine), contained Ki-67 or PCNA antigen. The histological preparations were photographed and obtained pictures were subjected to computer-assisted image analysis using Axiophot microscope (Carl Zeiss) coupled to a computer and the Multi-ScanBase V 8.08 software, working under Windows. Fifty percent of sections from mammary gland adenocarcinomas demonstrated BrdU labelling index of 4-5%, 40% of 1-3%, while in the remaining 10% of examined tumours no BrdU incorporation could be demonstrated. No evident relationship could be detected between the presence of BrdU incorporation and Ki-67 or PCNA antigen presence but a significant correlation was demonstrated between the expression of Ki-67 and PCNA.

Key words: BrdU, monoclonal antibody to BrdU, mammary gland carcinoma, bitches

Introduction

Malignant tumours are characterised by an extensive cellular polymorphism. The tumour may contain cells forming tumour parenchyma and cells forming its stroma, such as fibroblasts and cells of vascular endothelium, which may exhibit no neoplastic traits. Parenchymatic cells of a tumour may include intensely dividing cells as well as cells which manifest no proliferative activity (at G₀ or G₁ phase of the cell cycle) and cells which lost their ability to divide (necrotic, apoptotic cells). The presence of cellular hybrids is also observed, formed due to the reciprocal fusion of tumour cells as well as due to fusion of neoplastic and normal cells (Podbielski 1997). The pool of proliferating cells is most important for progression of the tumour since increase in the mass and volume of the tumour depends on this type of cells. The cells may