To Evaluate the Utility of Immunohistochemistry in the Diagnosis of Different Types of Central Nervous System Tumours Using a Panel of Antibodies

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Background

Primary malignant brain tumours are rare with high mortality rate. Management and prognostication of these tumours remain as the greatest challenge in oncology.

Correct identification of the lineage of origin and also differentiating primary from secondary neoplasms constitute the basis for definitive management of these tumours.

In many cases the clinical profile, neuroimaging studies, and histological appearances of the tumour may not be diagnostic of a particular neoplasm.

Aims & Objectives

1. To evaluate the immunoexpression pattern in different types of central nervous system tumours using a panel of antibody
2. To compare the immunoexpression pattern with tumour histology in terms of type, grade, mitotic activity, microvascular proliferation, and necrosis.
3. To correlate the utility of immunohistochemistry in the diagnosis of different types of central nervous system tumours using a panel of antibody.

Material & Methods

Cases

Biopsies from a total of at least 40 consecutive cases of CNS tumours of varying grades and types were included in the study.

Method

Gross examination

The entire specimens received were processed to obviate any sampling errors.

Routine histological processing

Specimens were fixed in buffered formalin and paraffin-embedded. Five – seven micron serial sections stained by routine hematoxylin-esoin (H&E) were studied under light microscope (LM). Data regarding type of tumour, pleomorphism, mitosis, vascular proliferation and necrosis was recorded in all cases.

Immunohistochemistry

Representative formalin-fixed paraffin-embedded sections of four - five micron from tumour were stained immunohistochemically using labeled streptavidin biotin (LSAB) technique. After deparaffinisation and rehydration, antigen retrieval was performed as per the specific antibody. Then, the sections were cooled at room temperature for 60 min, immersed in 3% hydrogen peroxidase for 10 min to block endogenous peroxidase activity, and then washed in tris-buffered saline (TBS) for 5 min.

The following panel of antibodies (all prediluted) were used :

- Glial fibrillary acidic protein (GFAP)
- S-100 protein (S-100)
- Epithelial membrane antigen (EMA)
- Vimentin (CK)
- Synaptophysin (Synapto)
- Neurofilament (NFP)

In every case immunoexpression expression was correlated with tumour histology in terms of type, grade, mitotic activity, microvascular proliferation, and necrosis.

Result

Immunohistochemistry helpsed determine the cellular lineage and histology in the 40 samples analyzed. It had diagnostic and prognostic implications.

Conclusions

The study will help to correctly identify various astrocytic and non-astrocytic CNS tumours, as well as differentiate primary from secondary neoplasms. This knowledge is vital in cases of primary CNS tumours since it directly influences the therapy and prognosis of the tumour.