ORIGINAL RESEARCH PAPER

Pathology

A STUDY ON PROGNOSTIC SIGNIFICANCE OF ER AND PR STATUS ALONG WITH Ki67 IN MENINGIOMA

KEY WORDS: Meningioma, Steroid , Progesterone, Estrogen Receptors

Dr. Ranjita Kumari* Junior Resident, Department Of Pathology, Rajendra Institute Of Medical Sciences , Ranchi *Corresponding Author

Dr. Rabindra Kumar Singh Associate Professor, Department Of Pathology, Rajendra Institute Of Medical Sciences, Ranchi.

Dr. Abhishek Kumar Verma Senior Resident, Department Of Pathology, Rajendra Institute Of Medical Sciences, Ranchi.

ABSTRACT

Meningioma is the most common CNS tumor in adults, usually attached to the dura. It accounts for approximately 35% of all primary CNS neoplasms. Meningiomas are benign neoplasms and usually demarcated from adjacent brain tissue. There is a marked female predominance in adults. An association between steroid hormone and risk of meningioma has been reported including an increased incidence of tumor in women, growth during pregnancy, presence of progesterone and to a lesser extent estrogen receptor. Aim- To conduct a retrospective study to evaluate the presence of estrogen and progesterone receptors in meningiomas and to correlate their expression to proliferative marker Ki67. Materials and methods- 30 cases of meningioma s were studied immunohistochemically to detect the expression of ER, PR and Ki67. Other parameters like age and sex were also analyzed.

INTRODUCTION

Meningiomas are predominantly benign CNS tumors of adults, usually attached to the dura, that arise from the meningothelial cells of the arachnoid. This distinctive group of tumors account for approximately 35% of all primary CNS neoplasms,15% of intracranial tumors and about 25% of intraspinal tumors. Meningiomas usually become clinically evident in middle age and are seen only rarely during childhood, wherein they represent about 3% of all CNS tumors. A marked female predominance is seen in adults.

An association between steroid hormones and risk of meningioma occurance has long been reported, including an increased incidence of these tumors in women, growth during pregnancy, presence of progesterone and to a lesser extent estrogen receptors. Although most meningiomas are benign, they have a surprisingly broad spectrum of clinical characteristics and histologically distinct subsets are associated with high risk of recurrence, even after complete resection. In rare instances meningiomas are malignant. About 80% meningiomas are slow growing tumors of WHO grade 1. Most commonly diagnosed histological subtypes are meningothelial, fibroblastc and transitional meningiomas.

Material and Methods

This retrospective study include 30 patients with meningiomas operated at neurosurgical department, Rajendra Institute Of Medical Sciences, Ranchi between 2014 to 2017. The specimens were sent to department of Pathology for histopathological examination. Out of 30 cases, 11 were male patients and 19 were female patients.

Paraffin wax embedded tissue sections were staind by hematoxylene and eosin. Types of meningiomas were categorized depending upon the WHO classification. Immunohistochemical detection of estrogen and progesterone receptors was performed by using anti-ER and Anti-PR monoclonal antibodies. All the sections were examined for the receptor status regardless of tumor grade. They were graded as ;

GRADE 0-No tumor cells were positively stained
GRADE 1-Less than 10% cells positively stained
GRADE 2- 10 TO 50% cells positively stained
GRADE 3-More than 50% cells positively stained

Figure 1: crumb rubber in cracker mill

TABLE – 1: sex distribution of variants of meningiomas

Types of meningioma	Females	Males
Transtional	10	05
Fibrobastic	08	04
Meningothelial	01	-
Atypical	-	02

RESULT

Among 30 cases, 15 cases were of transitional meningioma, 12 cases were of fibroblastic meningioma, 1 case of meningothelial meningioma and 2 cases of atypical meningiomas.

Out of 30 cases of meningiomas, 11 cases were in male and 19 in females (Table 1). Maximum number of patients were in the age group of 40-50 years (Table 2).

TABLE–2: Age distribution of various meningiomas

Age Group	Type of Meningioma
20-40 Years	03
40-50 Years	16
50-60 Years	07
More than 60 years	04

All the cases were negative for estrogen receptors. 3 cases were strongly positive, 17 cases were moderately positive and 10 cases were weakly positive for progesterone receptors. Only 2 cases of atypical meningioma were positive for Ki67.

In our study when the PR status was compared in relation to the age and sex, most of the patients who showed strong positivity for PR in tumor cells were in the age group of 40 to 50 years and were females.

Progesterone receptor staining was inversely related to Ki67 staining. 2 cases of atypical meningiomas which were weakly positive for PR receptors showed strong positivity with Ki67. Moderately positive PR tumors were negative with Ki67. 1 case of meningothelial meningioma as weakly positive for PR receptors was weakly positivity for Ki67 staining.

DISCUSSION

The meningiomas are slow growing, well circumscribed tumors which are generally benign. Some of them show atypical and anaplastic features. Many studies have suggested that the growth of meningiomas are associated with female sex hormones. During luteal phase of menstrual cycle and pregnancy, these tumors tend

to grow in size. Surgical removal of these tumors is the treatment of choice. However few tumors are not operable because of their invasion into the adjacent brain parenchyma and bone. Many studies have shown that most of the meningiomas are immunoreactive for ER and PR. Jey et al showed that growth of meningiomas were modified by hormonal changes. In our study progesterone receptors were expressed more than estrogen receptors. Tumors strongly positive for progesterone receptors were negative for Ki67. This shows tumors with high proliferative index have low expression of progesterone receptors.

CONCLUSION

The expression of PR status helps in evaluation of biological behaviour of meningiomas. The tumors which showed increased expression of PR had decreased proliferation rate, indicating better prognosis. Atypical tumors with increased proliferative rate showed decreased PR expression. Anti- progesterone drugs can be used to decrease the recurrence rate after surgical removal of meningiomas.

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