ORIGINAL RESEARCH PAPER

Pathology

P53 EXPRESSION IN SURFACE OVARIAN EPITHELIAL TUMORS

KEY WORDS: ovarian tumors, benign, malignant, p53

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ABSTRACT

Introduction: Ovarian cancers remain the most lethal of all gynecological malignancies despite major developments in their treatment.This study evaluated rate of expression and staining patterns of p53 epithelial ovarian tumors (EOT).
Material and Methods: This was a hospital based cross sectional observational study conducted for one year from 1st June 2019 to 31st May 2020 in the Department of Pathology, Indira Gandhi Medical College, Shimla.
Results: Amongst 34 cases with positive p53 expression 21.1% showed +3 IHC score followed by 18.42% cases with +2 IHC score. Only 5.3% cases revealed IHC score as +1. Forty-two out of total 76 cases were negative for p53 expression with score zero. In our study p53 positivity was higher in ≥ 40 years age group (53.9%) compared to only 25% in 21-39 years age group. On comparing p53 expression with menopausal status, expression was seen more in postmenopausal women 61.8% than in premenopausal women 30.95% (p=0.0072)
Conclusion: Age and menopausal status are associated with p53 expression in ovarian cancer.

INTRODUCTION

Ovarian tumors are notorious silent killers as they escape attention in early stage due to their anatomical location and are often not noticed until they have achieved a huge size [1]. Ovarian malignancy is the sixth most common cancer and the seventh most common cause of cancer deaths in women globally [2]. In most population-based registries in India, ovarian cancer is the third leading site of cancer among women, trailing behind cervix and breast cancer [3].

TP53 is the most frequently altered gene in human cancers and loss of functional p53 protein occurs in most epithelial ovarian cancers.[4] Association between p53 IHC positivity and histological subtype in the literature has been controversial. Hence, the need to study p53 IHC in an Indian cohort considering all the technical factors that could potentially affect the staining (the antibody clone, IHC technique, interpretation of staining, etc.).

This study aims to evaluate the expression of p53 by immuno histochemistry (IHC) in the different histological types.

METHODS

This was a hospital based cross sectional observational study conducted for one year from 1st June 2019 to 31st May 2020 in the Department of Pathology, Indira Gandhi Medical College, Shimla. All the surface epithelial ovarian tumour specimens with definite histopathological diagnosis, irrespective of age were considered for study.

Ovarian tumours other than surface epithelial ovarian tumours, metastatic tumours from non ovarian primary, patients with SEOTs on/prior radiation or chemotherapy and patients with recurrence of SEOTs were excluded from the study. Clinical profile of these patients was recorded in to a pre-designed proforma.

RESULTS

p53 immunohistochemistry

A case of high-grade serous carcinoma `of ovary with known positivity was used as a positive control. Stromal fibroblasts, endothelial cells and intratumoral lymphocytes also acted as positive intrinsic control. Positive expression on the immunostained slides was interpreted as the percentage of the positive tumor nuclei. Sections were positive when at least ≥5% tumor nuclei showed positive p53 immunostaining. In present study, thirty-four (44.7%) of total 76 SEOTs showed positivity for p53 immunostaining.

Amongst 34 cases with positive p53 expression 21.1% showed +3 IHC score followed by 18.42% cases with +2 IHC score. Only 5.3% cases revealed IHC score as +1. Forty-two out of total 76 cases were negative for p53 expression with score zero (<5% nuclei stained for p53).

Table 1: p53 expression score

p53 score	Proportion of nuclei stained	Number of cases (n=76)	Percentage
0	<5%	42	55.3%
+1	5-25%	4	5.3%
+2	25-75%	14	18.4%
+3	>75%	16	21.1%

Association of p53 expression with age

In our study p53 positivity was higher in ≥ 40 years age group (53.9%) compared to only 25% in 21-39 years age group (Table 2).

Table: 2 Correlation of age group with p53 positivity.

Age group	p53 Positive (number)	p53 Negative (number)	P value
21-39 years	6	18	**0.018**
≥ 40 years	28	24	

Association of p53 expression with menopausal status

On comparing p53 expression with menopausal status, expression was seen more in postmenopausal women 61.8% than in premenopausal women 30.95% (p=0.0072) (Table 3).

Table 3: Association of p53 expression with menopausal status

Variable	p53 (+)ve	p53 (-)ve	P value
Pre-menopausal	13	29	**0.0072**
Post –menopausal	21	13	

DISCUSSION

In this study, p53 was expressed in 21.1% of the ovarian tumors. Other similar studies have shown variable ratios (25.6%-61%). The reasons for this variation are unknown. However possible sources for this variation may be attributed to:

a. The properties of different antibodies.
b. The scoring methods applied for p53 immunoreactivity.
c. The enzyme and microwave treatments of the tissue during the staining process.
d. The tissue fixation procedure.

P53 expression was mainly found in the 3rd decade of life (30.9%). This may be related to the accumulation of somatic mutations. It is known that loss of heterozygosity on chromosome 17 increases with age.

CONCLUSION

Age and menopausal status are associated with p53 expression in ovarian cancer.

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