



P53 IMMUNOEXPRESSION AS A PREDICTOR OF RECURRENCE IN HEAD AND NECK SQUAMOUS CELL CARCINOMA IN POPULATION OF NORTH EAST INDIA

Pathology

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ABSTRACT

Most of the carcinomas of head and neck region are squamous cell carcinoma, having multifactorial and multistep involvement. In India, specially in North-East region, a large number of people are suffering from squamous cell carcinoma of head and neck. Since these types of carcinomas have a high impact on mortality and morbidity, we have to give importance in finding some indicators, which can signify its designation in recurrent cases of such carcinomas. Such an indicator is p53 mutation. P53 is a tumour suppressor gene, which gets mutated in most of the head and neck squamous cell carcinoma and can be identified by immunohistochemical method. So here we are considering a study to verify the importance of p53 mutation in head and neck squamous cell carcinoma in relation to its time of recurrence.

Here, we are considering 45 recurrent cases of head and neck squamous cell carcinoma in North East region of India, 15 cases each in category of recurrence within 6 month to 1 year, 1-2 year and 2-3 year. We did IHC staining according to protocol and divided them according to the intensity of p53 positivity. We found out that 87% of the cases that reoccurred within 6 month to 1 year have strong positivity for p53 immunostaining. 60% and 27% cases were strongly positive for p53 that reoccurred within 1-2 years and 2-3 years respectively. So the intensity of p53, suggestive of p53 mutations strong in early recurrent cases than those having late recurrence.

KEYWORDS

Squamous Cell Carcinoma, Immunohistochemical

INTRODUCTION:

In India, there is a high incidence of mortality and morbidity from head and neck squamous cell carcinoma, having incidence of 30 per 1,00,000 population.[1,2] In North East region, incidence of oral cancer is 33% with a high rate of recurrence.[3] Various factors effect the North East region population in causing recurrent head and neck squamous cell carcinoma, mostly related to their habit of chewing tobacco, areca nut(pan/gutka), alcohol and smoking.[4,5] Epidemiological studies also disclose a significant association between head and neck squamous cell carcinoma with consumption of previously mentioned substances.[6] Several genetic basis has also been implicated related to head and neck squamous cell carcinoma.[7] People having such carcinoma are supposed to have mutated p53, a tumour suppressor gene, which encodes several isoforms of p53 protein. Mutation in p53 causes accumulation of mutated p53 protein, which cannot act as a tumour suppressor gene, leading to uncontrolled proliferation of involved cells and it can be detected by immunohistochemical procedure.[8,9] High incidence of p53 is a bad prognostic marker and it can be related to early recurrence in patients having previous episodes of squamous cell carcinoma. However we have to differentiate recurrence from second primary tumour. Warren Gates criteria a diagnosis of second primary tumour are (a) each tumor should present a definite picture of malignancy (b) each tumor should be histologically distinct and they should be separated by normal mucosa (c) the possibility that one is metastasis of the other must be excluded and they occur after a time period of 3 years.[10]

MATERIAL AND METHOD:

Clinical details of the patient were retrieved including age, sex, sign and symptom, duration and previous history of carcinoma. All relevant documents were obtained. Informed consent was taken from the patients. Specimen was subsequently fixed in 10% formalin, processed in an automated tissue processor, paraffin embedded and cut at 4-5 u thickness at rotatory microtome and studied with H&E stain for histopathological assessment of tumour and grading is done according to Border's Classification into Mild, Moderate and Poorly differentiated SCC.[11] Immunohistochemical stain was done using p53 antibody. For p53 protein expression, nuclear positivity was assessed quantitatively. The percentage of positively stained cell in the whole layer of epithelium was determined by scanning the entire section and was recorded by assigning cases to one of the following categories[12,13]:

(a) 0 = no epithelial cell staining

(b) 1+ = upto 25 % cells showing positive staining

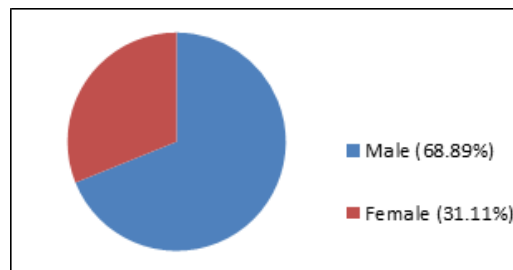
© 2+ = upto 50% cells showing positive staining

(d) 3+ = more than 50 % cells showing positive staining (strong positivity)

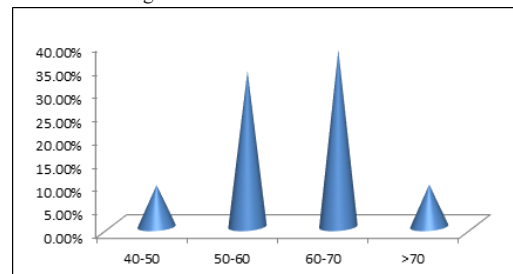
RESULT AND OBSERVATION:

The data analysis is illustrated in the form of table:

(1) Distribution of sex in recurrent head and neck SCC:



(2) Distribution of age in recurrent head and neck SCC:



(3) Distribution of site of recurrence of SCC:

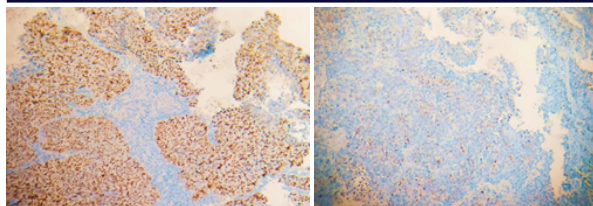
SITE	TOTAL
Oral cavity	29 (64.44%)
Oropharynx	6 (13.33%)
Nasopharynx	3 (6.67%)
Larynx	7 (15.56%)

(4) Types of SCC in recurrent cases:

TYPES	6 mnth-1 yr	1-2 yr	2-3 yr
PDSCC	11	9	7
MDSCC	4	4	6
WDSCC	0	2	2

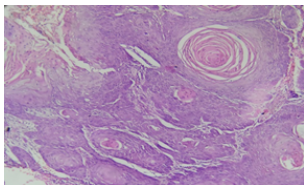
(5) Intensity of p53 immunoexpression in recurrent SCC:

AGE	INTENSITY			
	0	1+	2+	3+
6 mnth-1yr	0	0	2	13(87%)
1-2 yr	0	1	5	9(60%)
2-3 yr	0	3	8	4(27%)



Strong p53 positivity (3+) in cases of recurrent tumour <1yr

1+ positivity in p53 staining in cases of recurrent tumour >1yr



HPE of a case of a case of recurrence in head and neck SCC

DISCUSSION:

As seen in the data provided earlier, it has been confirmed that p53 is an indicator of prognostic marker of time of tumour recurrence in head and neck SCC due to its high expression in early recurrent cases.

According to a study carried by Dong M et al, it was found that expression of p53 protein in tumour cells is an important adverse prognostic factor for duration of overall survival, time to recurrence from primary tumour, time to second primary tumour and time to treatment failure.[14] Similarly, Atif Ali et al. also suggested a significant association of p53 with early recurrence and extranodal extension having high tumour grade, which are key prognostic factors of HNSCC.[15] Biji et al. also showed that p53 immunoreexpression is a marker of bad prognosis and early recurrence.[16] Jasmeet et al. also stated that p53 positivity shows a direct correlation with bad prognosis.[17] On the other hand, a study carried by Ruchi Dhuria et al. found no correlation between p53 immunoreexpression and tumour recurrence.[18]

CONCLUSION:

Our study reveals that the intensity of p53, suggestive of p53 mutation status, is strong in cases of early recurrence and the intensity gradually decreases in cases having prolonged period of recurrence, hence suggesting that p53 is a poor prognostic marker indicating early recurrence in head and neck squamous cell carcinoma.

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