ORIGINAL RESEARCH PAPER

Volume-8 | Issue-8 | August - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CORRELATION OF P53 EXPRESSION BY IMMUNOHISTOCHEMISTRY WITH GRADE AND NODAL STATUS IN OROPHARYNGEAL SQUAMOUS CELL CARCINOMA OF GAUHATI MEDICAL COLLEGE – 2 YEARS RETROSPECTIVE STUDY

Pathology

Dr. Muktanjalee Deka Associate Professor, Department of Pathology, Gauhati Medical college & Hospital.

Dr . Pioja Pegu* Post Graduate trainee, Department of Pathology, Gauhati Medical College & Hospital. *Corresponding Author

ABSTRACT

Backround & objectives: Squamous cell carcinoma is the most common oral cancer. p53 overexpression has a prognostic signifance on Oropharygeal Squamous cell Carcinoma(OPSCC).The current study has been undertaken to correlate hislogical grades, p53 expression and its correlation with lymph node metastasis.

Methods: Histopathologically diagnosed 32 cases of Oropharygeal Squamous cell carcinoma during a period of 2 years in the Department of Pathology, Gauhati Medical College & Hospital were included in the study and immunohistochemistry was performed with p53. All the cases were graded according to Broder's system.

Results: Of the Oropharygeal squamous cell carcinoma, 53.1% showed p53 positivity. Mean labelling index of Poorly differentiated > moderately differentiated > well differentiated. P53 positivity rate in patients with lymph node metastasis was 84.6% , which is significantly higher than that in the patients without lymph node metastasis (31%).Out of 32 cases 13(40%) had cervical lymph node metastasis.

Conclusion: This study concludes that p53 positivity is significantly associated with the histological grades and lymph node metastasis in OPSCC. So can be used as a significant prognostic marker for OPSCC.

KEYWORDS

Squamous cell carcinoma, lymph node metastasis, p53, labelling index

INTRODUCTION:

Worldwide, oral cancer is the sixth most prevalent cancer, ranking eighth in developed countries and third in the developing world (eg. India, Pakistan,Sri Lanka)[1]. More than 90% of oral cancer are oral squamous cell carcinoma. Histological grading and lymph node metastasis correlates poorly with clinical outcomes[2].

TP53 genes are commonly mutated gene in OPSCC. The main function of p53 is cell cycle arrest, DNA damage repair and apoptosis. Initially p53 assist in DNA repair by causing G1 arrest and inducing DNA repair genes. If the DNA damage is not repaired successfully , the p53 stimulates the apoptosis induced genes and induces apoptotic cell death. Mutant p53 fails to repair the damaged DNA and thus promote tumorigenesis. The analysis of p53 expression in OPSCC has led to predict the overall survival , recurrence -free survival ,and likelihood of lymph node metastasis[3,4,5]. Thus, it has an impact on patient treatment and management. The present study was undertaken to correlates p53 expression by immunohistochemistry with grade and nodal status in OPSCC .

MATERIAL & METHODS:

A total of 32 cases of histologically diagnosed OPSCC at the Department of Pathalogy, Gauhati Medical College & Hospital over a period of 2 years were included. Cases were classified as Well differentiated squamous cell carcinoma(16) , moderately differentiated (11) and Poorly differentiated(5) according to the Broder's system. Out of 32 cases of OPSCC, 13 cases showed lymph node metastasis.

Broder's system (descriptive term)

Well differentiated (Grade I)	<25% undifferentiated cells
Moderately differentiated (Grade II)	<50% undifferentiated cells
Poorly differentiated (Grade III)	<75% undifferentiated cells
Anaplastic / Pleomorphic (Grade IV)	>75% undifferentiated cells

Immunohistochemistry was performed with p53. p53 analysis was done on parameters such as distribution of expression in all layer, intensity of staining and the labelling index(LI). The analysis of p53 positive cells was performed on IHC stained sections. Only staining of nucleus of epithelial cells was observed ; nuclei with clear brown colour regardless of staining intensity were regarded as P53 positive. The labelling index or percentage of positive cells were expressed as a percentage of the total number counted for individual layer and complete epithelium.

The results obtained were analysed using Chi-square test. Values of $p<0.05$ were considered as statistically significant.

RESULTS:

1. Of the Oropharyngeal squamous cell carcinoma 53.1% showed p53 positivity using a threshold of 10% stained nuclei.
2. Mean labelling index of Poorly differentiated > moderately differentiated > well differentiated.
3. P53 positivity rate in patients with lymph node metastasis was 84.6% , which is significantly higher than that in the patients without lymph node metastasis(31%)
4. Out of 32 cases 13(40%) had cervical lymph node metastasis.

Table 1: Mean labelling index of OPSCC cases

Tumor differentiation	Mean labelling index(LI)%
Well	41.35
Moderately	73.11
Poorly	89.10

Table 2:

Lymph node metastasis(n=32)	Cases	P53 positive	P53 negative
No	19	6	12
Yes	13	11	2

Table 3: Number of patients and the frequency of cervical lymph node metastasis according to Broder's grading system(n=32)

Broder's classification	No. of patients with metastasis(n=13)	No. of patients without metastasis(n=19)	Total number
Well	2	14	16
Moderate	6	5	11
Poor	5	0	5

P <0.05

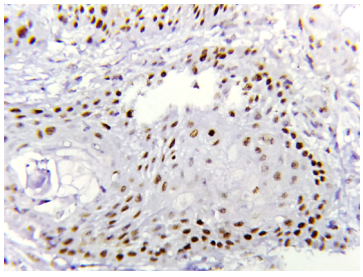

Fig 1: p53 positivity in well differentiated Squamous cell carcinoma

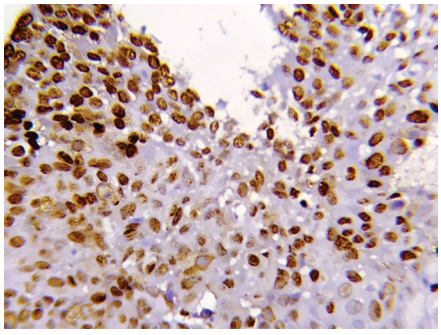

Fig 2: p53 positivity in moderately diffentiated squamous cell carcinoma

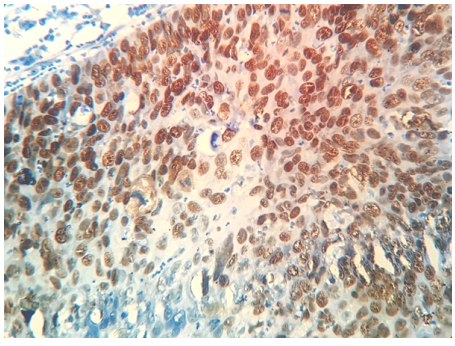

Fig 3: p53 positivity in Poorly differentiated squamous cell carcinoma.

DISCUSSION:

P53 expression increases with increasing grades of malignancy. There is statistically significant association of P53 with cervical lymph node metastasis and different grades of OPSCC. Grades of differentiation showed significant correlation with the occurrence of cervical lymph node metastasis.

Study done by TN Suresh et al(2019) showed significant correlation with the occurrence of cervical lymph node metastasis[6].

Study done by Vc Sandulache et al (2018) showed association of p53 mutations with lymph node metastasis[7].

Study done by Hashmi AA et al(2018) found association of p53 with high grade
tumor[8].

Study done by Dave KV et al (2016) showed significant association with high grade malignancy and p53 over expression[9].
Study done by Yadong Li et al (2015) showed correlation of p53 expression and lymph node metastasis[10].

Study done by L Yang et al (2015) found that p53 was associated with OSCC and
pathologic grade but did not correlate with lymph node metastasis[11].

Study done by P Thongsukai et al (2014) found that the frequencies of p53 expression
in OPSCC is 53%[12].

Study done by JC de Vicente et al(2004) showed 52.7% overexpressed p53 and prognostic correlation with neck node metastasis in patients with Oral squamous cell carcinoma[13].

Our studies correlates with the above studies.

Thus , it is observed that there is significant importance of p53 in grading and a strong relationship between p53 overexpression and lymph node metastasis in OPSCC. Thus, P53 can be used as a specific prognostic marker in patient with OPSCC.

CONCLUSIONS:

OPSCC constitutes a major health problem in developing countries, representing the Leading cause of death. The prognosis for OPSCC which are treated early is much better, with a 5 year survival of 80%. P53 overexpression can be used as as specific marker of OPSCC and their IHC emerges as a clinically useful supplement for histopath ological assessment of grading of Oropharyngeal Squamous cell Carcinoma.

REFERENCES:

1. American Cancer Society. Cancer statistics 2006.Accessed athttp://www.cancer.org/docroot/PRO/content/PRO_1_1_Cancer_Statistics_2006_presentation.asp
2. Brandwein-Gensler M, Teixeira MS, Lewis CM, Lee B, Rolnitzky L, Hille JJ, et al. (2005). Oral squamous cell carcinoma: histologic risk assessment, bu! not margin status, is strongly predictive of local disease-free and overall survival. Am J Surg Pathol. 29:167-78. PMID:15644773
3. Belbin TJ, Singh B, Barber I, et al. Molecular classification of head and neck squamous cell carcinoma using cDNA microarrays. Cancer Res. 2002;62(4):1184-1190.
4. O'Donnell RK, Kupferman M, Wei SJ, et al. Gene expression signature predicts lymphatic metastasis in squamous cell carcinoma of the oral cavity. Oncogene. 2005;24(7): 1244-1251.
5. Roepman P, Wessels LF, Kettelarij N, et al. An expression profile for diagnosis of lymph node metastases from primary head and neck squamous cell carcinomas. Nat Genet. 2005;37(2):182-186.
6. Suresh TN, Hemalatha A, Kumar MH, Mohiyuddin SA. Evaluation of histomorphological and immunohistochemical parameters as biomarkers of cervical lymph node metastasis in squamous cell carcinoma of oral cavity: A retrospective study. Journal of oral and maxillofacial pathology: JOMFP. 2015 Jan;19(1):18.
7. Sandulache VC, Michikawa C, Kataria P, Gleber-Netto FO, Bell D, Trivedi S, Rao X, Wang J, Zhao M, Jasser S, Myers JN. High-risk TP53 mutations are associated with extranodal extension in oral cavity squamous cell carcinoma. Clinical Cancer Research. 2018 Apr 1;24(7):1727-33.
8. Hashmi AA, Hussain ZF, Hashmi SK, Irfan M, Khan EY, Faridi N, Khan A, Edhi MM. Immunohistochemical over expression of p53 in head and neck Squamous cell carcinoma: clinical and prognostic significance. BMC research notes. 2018 Dec;11(1):433.
9. Dave KV, Chalishazar M, Dave VR, Panja P, Singh M, Modi TG. Immunohistochemical expression of p53 and its clinicopathological correlation with modified Anneroth's histological grading system. Journal of oral and maxillofacial pathology: JOMFP. 2016 Jan;20(1):29.
10. Li Y, Zhang J. Expression of mutant p53 in oral squamous cell carcinoma is correlated with the effectiveness of intra-arterial chemotherapy. Oncology letters. 2015 Nov 1;10(5):2883-7.
11. Yang L, Wang Y, Guo L, Wang L, Chen W, Shi B. The expression and correlation of iNOS and p53 in oral squamous cell carcinoma. BioMed research international. 2015;2015.
12. Thongsuksai P, Pruegsanusak K, Boonyaphiphat P. Prognostic significance of p16, p53, Bcl-2, and Bax in oral and oropharyngeal squamous cell carcinoma. Asian Biomedicine. 2014 Apr 1;8(2):255-61.
13. Carlos de Vicente J, Junquera Gutierrez LM, Zapatero AH, Fresno Forcelledo MF, Hernández‐Vallejo G, Lopez Arranz JS. Prognostic significance of p53 expression in oral squamous cell carcinoma without neck node metastases. Head & Neck: Journal for the Sciences and Specialties of the Head and Neck. 2004 Jan;26(1):22-30.