



"A HISTOPATHOLOGICAL STUDY OF TUMORS OF ORAL CAVITY"

**Dr. P.V. Kala
Chandra Sekhar**

Assistant professor, Department of pathology, Siddhartha Medical college, Vijayawada, Andhrapradesh.

Dr. B. victor Paul*

Assistant Professor, Department Of Pathology, Siddhartha Medical College, Vijayawada, Andhrapradesh. *Corresponding Author

ABSTRACT

Background: The incidence of oral cavity neoplasms in the population has increased manifold over the years. Oral cancer is one of the common cancers in the world, common in India, and also in Bangladesh, Srilanka and Pakistan. Oral cancer is one of the few cancers, whose cause were known and hence it is possible to prevent. The real challenge in oral cancer lies in its prevention and early diagnosis.

Objectives: 1.To study the morphological spectrum of neoplasms in oral cavity. 2.To study the age and gender incidence of various neoplasms. 3.To study the commonest sites of various neoplasms. 4.To evaluate or analyse the associated risk factors.

Materials and methods: This is a prospective study of the cases attended to Government General Hospital, Vijayawada or Government Dental College Hospital Vijayawada, of oral cavity neoplasms. The biopsy of the tissues was carried out at the Department of Pathology, Siddhartha Medical College, Vijayawada. The study period was from June 2011 to August 2013 over a period of two years and three months.

Results: The Study comprises a total of 74 surgical biopsies from oral cavity neoplasms received in the Department of Pathology, 52 of these were malignant lesions and 20 were premalignant conditions. The invasive squamous cell carcinoma was the most frequent histological type of oral cavity neoplasms. Among the oral cancers, peak age incidence was the 5th and 6th decade of life. There was significant male preponderance. Tongue was the most common site involved. Smokeless tobacco consumption was the commonest associated habit which leads to malignancy.

Conclusion: In this study we observed that among the oral cavity neoplasms, high incidence of carcinomas are seen, among these squamous cell carcinomas are predominant.

KEYWORDS : Oral cancers; Oral cavity tumors

INTRODUCTION

The incidence of oral cavity neoplasms in the population has increased manifold over the years. Oral cancers are the sixth most common neoplasms in the world today¹. Oral cancer is the commonest cancer in India, accounting for 50-70% of total cancer mortality. In males, oral cancer represents 5% of total body cancers and 2% in females². The increased incidence especially among younger generations, possibly related to rising trend of paan masala, chewing of gutkha, khini, zardha and other tobacco product. Smoking of chutta, beedi, cigarettes and alcohol consumption in the population has contributed to the rise in these conditions.

Low socioeconomic condition related to poor hygiene, poor diet or of viral infections has also play a role in development of oral cavity tumours. Oral cancer is one of the few cancers, whose cause is known and hence it is possible to prevent. The real challenge in oral cancer lies in its prevention and early diagnosis. A comprehensive effort is needed to identify the cause of such high prevalence, generate awareness and treatment options suited to meet this challenge.

Most common sites to involve vary geographically reflecting different risk factors. Oral cancer may be located at the buccal mucosa, gingiva, and hard palate, anterior two-thirds of the tongue and the floor of mouth. 95% of cancers of the Head and Neck are squamous cell carcinomas, arising most commonly in the oral cavity. Oral carcinoma is not diagnosed or treated early, because patients come at an advanced stage.

Most cases occur in men over the age of 50years, in women although the relative incidence among and younger patients seems to be increasing. HPV has also been suggested an etiologic role for both benign and malignant oral lesions. The overall 5-year survival rates are about 90% for carcinomas of the lower lip; 60% for tumours of the anterior tongue; 40% for tumours of the posterior tongue, floor of mouth, tonsil, gingiva, and hard palate³.

In the present study an effort has been made to select cases with clinical background of oral tumours and a study of histopathology was made correlating with patient's clinical data. An attempt has been made to compare the data of present study with the other similar studies done elsewhere.

RESULTS:

Present study was a prospective study of the cases of oral cavity neoplasms, carried out in the Department of Pathology, Siddhartha Medical College, Vijayawada, from June 2011 to August 2013. Cases were that attended to Government General Hospital, Vijayawada or Government Dental College Hospital Vijayawada. This study includes a total of 74 cases, 52 of these were malignant lesions and 20 were benign tumours and 2 were premalignant conditions Among the oral cancers, peak age incidence was the 5th and 6th decade of life. There was significant male preponderance. Intra oral growth (51.35%) or ulcer (37.83%) was the commonest presenting symptom. The invasive squamous cell carcinoma was the most frequent histological type of oral cavity neoplasms. Among the squamous cell carcinomas, well differentiated squamous cell carcinoma (62.74%) was the commonest histological grade in the present study. Tongue was the most common site involved. Smokeless tobacco consumption was the commonest associated habit which leads to malignancy.

Table-1: Showing age incidence of oral cavity neoplasms

Sl No	Age	Male	Female	Total	Percentage
1	0-10y	1	0	1	1.35%
2	11-20y	1	0	1	1.35%
3	21-30y	2	0	2	2.70%
4	31-40y	8	3	11	14.86%
5	41-50y	9	3	12	16.21%
6	51-60y	16	6	22	29.72%
7	61-70y	17	3	20	27.02%
8	71-80y	3	1	4	5.40%
9	81-90y	1	0	1	1.35%
10	Total	58	16	74	100%

Maximum number of cases are seen in 51-60 years age group (29.72%), followed by 61-70 years age group, (27.02%) and 41-50 years age group . (16.21%).

Table-2: Showing gender incidence of oral cavity neoplasms.

Gender	No. of cases	Percentage
Male	58	78.37%
Female	16	21.62%
Total	74	100%

The above table shows male preponderance with M: F ratio of 3.62:1.

Table-3: Showing distribution of habits of oral cavity neoplasms

Sl.No.	Habits	No. of cases	Percentage
1	Tobacco chewing	23	31.08
2	Smoking	6	8.10
3	Alcohol	3	4.05
4	Pan	12	16.21
5	Smoking & Alcohol	14	18.91
6	Nil	16	21.62
7	Total	74	100

Maximum cases are tobacco chewing, 23cases (31.08%) out of total 74 cases

Table-4: Showing site wise distribution of oral cavity neoplasms

Sl.No.	Site of Lesion	No. of cases	Percentage
1	Tongue	22	29.72%
2	Cheek/Buccal cavity	21	28.37%
3	Lip	12	16.21%
4	Palate	05	5.40%
5	Alveolus	04	6.75%
6	Floor of mouth	03	4.05%
7	Retromolar region	02	2.70%
8	Teeth & Gingiva	05	6.75%
9	Total	74	100%

Maximum number of cases are seen in Tongue - 2 (29.72) followed by Cheek - 21cases (28.37)

Table-5: Showing morphological spectrum of oral cavity neoplasms

Sl.No	Histopathological diagnosis	No. of cases	%
1	Squamous cell carcinomas (SCC)	51	68.91
2	Muco epidermoid carcinoma	1	1.35
3	Squamous Papilloma	6	8.10
4	Hemangioma	6	8.10
5	Pyogenic granuloma	7	9.45
6	Odontogenic Tumor	1	1.35
7	Dysplasia/leukoplakia	2	2.70
8	Total	74	100%

Squamous cell carcinoma is the most common tumour among all the oral cavity neoplasms – 51 cases out of 74 cases (68.91%).

Table-6: Showing morphological spectrum of squamous cell carcinomas

Sl. No	Histopathological diagnosis	No. of cases	Percentage
1	Well differentiated SCC	32	62.74%
2	Moderately differentiated SCC	17	33.33%
3	Poorly differentiated SCC	1	1.96%
4	Basaloid variant of SCC	1	1.96%
5	TOTAL	51	100%

Well differentiated squamous cell carcinoma is the most

common subtype among the squamous cell carcinomas – 32 cases out of 51 cases (62.74%).

Table7: Showing morphological spectrum of benign tumours

Sl. No	Histopathological diagnosis	No. of cases	Percentage
1	Pyogenicgranuloma	7	35%
2	Hemangioma	6	30%
3	Squamous papilloma	6	30%
4	Odontogenic tumours	1	5%
5	Total	20	100%

Pyogenicgranuloma predominates with seven cases (35%) among the twenty benign neoplasms.

Table8: Showing Clinical presentation of tumours

Sl No	Clinical presentation of tumour	No of cases	Percentage
1	Growth	38	51.31%
2	Ulcer	28	37.83%
3	Ulceroproliferative	6	8.10%
4	Cystic	1	1.35%
5	White plaque	1	1.35%

Majority of oral cavity tumors clinically present as growth and ulcers, some are Ulceroproliferative and pre malignant conditions commonly appear as plaques.

WELL DIFFERENTIATED SQUAMOUS CELL CARCINOMA

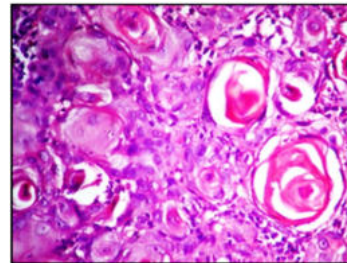


Fig-1 Highpower views show sheets of pleomorphic squamous cells and keratin pearls. (H&E)

MODERATELY DIFFERENTIATED SCC

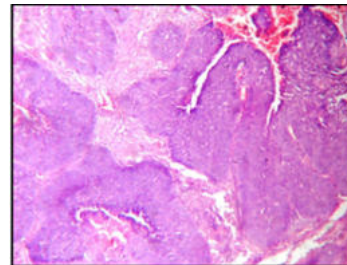


Fig – 2 Low power views showing pleomorphic squamous epithelial cells with individual cell keratinization, arranged in infiltrating sheets, nests and cords (H&E)

POORLY DIFFERENTIATED SQUAMOUS CELL CARCINOMA

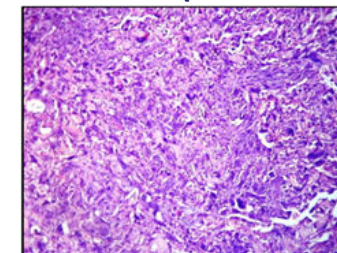


Fig – 3. 10x view showing pleomorphic epithelial cells arranged in sheets, tumor cells showing high nuclear pleomorphism (H&E)

BASALOID SQUAMOUS CELL CARCINOMA

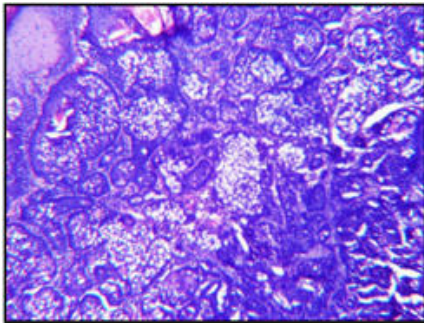


Fig-4 Shows tumour cells arranged in lobules and nests, peripheral cell palisading (H&E)

DISCUSSION:

Oral cancer is one of the common cancers in the world, common in India, and also in Bangladesh, Srilanka and Pakistan. In India, head and neck cancers (HNCA) account for 30-40% cancers at all sites, out of which 9.4% being oral cancers. It is the sixth common cause of death in males and seventh in females⁴.

Oral cavity neoplasms are common in India due to higher consumption of tobacco in the form of chewing as well as smoking. The aim and objectives of the present study is to study the histological spectrum of the tumours that occurs in oral cavity and to correlate the clinical and micro anatomical data for reaching towards accurate diagnosis along with a study of prevalence of these lesions and to analyze the morphological spectrum; commonest sites, associated risk factors; age and gender incidence of oral cavity neoplasms. The results thus obtained are analyzed and discussed in the light of other reputed research publications. The present study includes all the cases that appeared of oral cavity neoplasms that are reported in the Dept. of Pathology, Siddhartha Medical College Vijayawada, over a period of two years that is from June 2011 to August 2013. A total of 4662 biopsy specimens are received in the Department of Pathology among which 74(1.58%) were oral cavity neoplasms. The discussion is presented under the headings of age incidence, gender incidence with analysis of risk factors, site and histological type.

1. AGE INCIDENCE OF ORAL CAVITY NEOPLASMS: Our study includes cases below 10 years to above 80 years.

Table 9: Showing comparison of age incidence of oral tumors with various studies (in percentage)

Age	Sharma et al (1964) ⁵	Gopalakris hna et al (1967) ⁵	Thakur B.S. (1997) ⁷	Abhinandan (2006) ⁴	Present study
0-10y	0	0	0	-	1.35
11-20y	0	0	0.8	1.63	1.35
21-30y	1.6	2.1	4.2	4.94	2.70
31-40y	32.8	16.0	12.5	15.38	14.86
41-50y	33.7	34	28.5	15.38	16.21
51-60y	26.2	35.1	32.5	35.16	29.72
61-70y	5.7	6.2	19.2	33.33	27.02
71-80y	0	6.2	25	7.69	5.40
81-90y	0	0	0	1.09	1.35
Total	100	100	100	100	100

The maximum number of cases (i.e., 54 cases, 72.97 %), are observed between 4th to 7th decades, in which majority are malignant lesions. Among malignant tumours, squamous cell carcinomas are the predominant group. The age incidence of squamous cell carcinomas showed a wide range, starting from 30 to 80years. Maximum number of cases are seen in 51-60 years age group (29.72%), which is comparatively similar to

Abhinandan⁴(2006), Sharma et al (1964)⁵ Gopalakrishna et al⁶ (1967) 69% and Thakur B.S et al⁷(1997) 60%. Followed by 61-70 years age group, (27.02%) and 41-50 years age group (16.21%). In the present study highest number of cancers of oral cavity, that is 61.11% occur in the age group of 5th to 6th decade. The higher incidence of squamous cell carcinoma in 5th-7th decade of life, occur predominantly in patients with higher consumption of tobacco in the form of chewing, smoking and alcohol or both.

2. GENDER INCIDENCE OF ORAL CAVITY NEOPLASMS:

In the present study oral tumours showed a marked male preponderance with male to female ratio of 3.62:1 (58males and 16 females) and findings of these studies is accordance with other studies. This higher incidence of oral tumours may be due to higher consumption of tobacco in males in various forms like chewing, smoking and pan eating.

Table 10: Showing comparison of gender distribution of oral cancers

Sl. No.	Author	M : F ratio
1	Sharma (1964) ⁵	3.95 : 1
2	Haribhakti & Mehta et al (1990) ⁸	1.84 : 1
3	Mridu Manjari et al (1996) ⁹	2.18 : 1
4	Mehrotra Ravi et al (2003) ¹⁰	3.27 : 1
5	Abhinandan (2006) ⁴	2.14 : 1
6	Present study	3.33 : 1

Majority of the studies found a male preponderance in their studies. In the present study 76.92% are males while 23.07% are females affected with oral malignancies. The M: F ratio, is similar with the study reported by Mehrotra Ravi et al¹⁰ (2003) and Sharma⁵ (1964).

3. INCIDENCE OF RISK FACTORS IN ORAL CAVITY NEOPLASMS:

Alcohols, tobacco, areca nut like some of the psychoactive substances are commonly used by Indian people. All these are implicated in development of oral lesions like gingivitis, dental caries, extrinsic stains, leukoplakia, erythroplakia, oral submucous fibrosis (OSF), periodontitis, melanosis and in initial stages and later development of malignancy i.e., squamous cell carcinoma.

Common form of tobacco consumption in India:

Gutkha is a mixture of betel nut and chewing tobacco. It is extremely addictive and is apparently targeted at youngsters. **Quid** is the mixture of tobacco and lime and extensively consumed in India.

Be it in the form of Gutkha, Quid, snuff or misri and so on, the tobacco when kept in mouth leaches out carcinogens, which act on the mucosa causing precancerous lesions, which lead to cancer¹¹.

Table 11: Showing comparison of the associated risk factors in oral tumours

Habits	Sharma (1964) ⁵	Saxena and Agarwa ¹² (1965)	Gopalakris hna et al ⁶ (1967)	Thakur B.S (1997) ⁷	Present study
Tobacco chewing	69.2%	91.3%	80.4%	89.3%	41.89%
Smoking	50.8%	54.9%	51.5%	42.7%	8.10
Alcohol			12%	36%	4.05%
Pan					16.21%
Alcohol+ smoking					18.91%
Nil					10.81%

In the present study, the majority were tobacco chewers (41.89%) and alcoholic and smokers (18.91%). However previous studies showed a much higher consumption of

tobacco chewing in patients with oral tumours, ranging from 69.2% to 91.3%. In This study lower association of tobacco chewing may be due to regional variation in tobacco use and also use of tobacco in the form of smoking, gutkha, pan or use of areca nut without tobacco more commonly. The use of betel nut increases the friction over oral mucosa resulting in mechanical trauma to oral cavity. The betel nut also releases Arecoline which is carcinogenic. Smoking along with drinking alcohol has an additive risk of oral neoplasms¹⁷. Pan masala contains Areca nut, slaked Lime, Catechu, and Condiments, though there is no tobacco in this pan Areca nut and others also has the carcinogenic property. In this region consumption of Pan is also high.

In the present study, 8 cases of squamous cell carcinomas are not associated with known risk factors. In these cases, the role of HPV infection in the etiology of oral carcinogenesis may be considered and further evaluated to detect HPV. HPV types 2, 4, 6, 11, 13, and 32 are statistically associated, with the benign oral lesions and the malignant ones with HPV types 16, 18, and 33¹⁸. HPV carcinogenesis is thought to result from the E6 and E7 viral oncoproteins¹⁹. HPV positive tumours have good prognostic value so the importance of establishing HPV etiology in oral carcinogenesis is significant. But, in the present study, we could not evaluate these 8 cases further, due to certain limitations.

Table-12: incidence of oral cavity neoplasms at various sites (In percentage)

Site of lesion	Saxena & Agarwal (1965) ¹²	Gopala Krishnaet. al (1967) ⁶	Krolls& Hoffman (1976) ¹³	Alvi et al ¹⁴ (1996)	Thakur B.S. ⁷ (1997)	This study
Tongue	28.9	24.7	24	30.1	30.3	29.72
Cheek	56.8	51.5	12	12	42.5	28.37
Lip	3.3	7.2	23	10.4	15	16.21
Palate	4.3	5.2	04	3.2	5.8	5.40
Alveolus	6.7	9.3	11	16.7	2.5	6.75
Floor of mouth	-	2.1	26	27.6	3.3	4.05
Retromolar region	-	-	-	-	0.8	2.70
Teeth & Gingiva	-	-	-	-	-	6.75
Total	100	100	100	100	100	100

The present study shows majority of cases occurring, in the tongue (29.72%) which is in accordance with the results in the study conducted by Alvi et al¹⁴, with 30.1% of cases occurring in tongue, and also associated with other studies done by Thakur B.S.7 with 30.3% and Saxena & Agarwal¹², with 28.9% of cases occurring in tongue.

Table 13: Showing comparison of histopathological spectrum of oral cancers

Histopathological spectrum	Mridu Manjari etal ⁹ (1996)	Jasser K. ma'aita ¹⁵ (2000)	Abdul Wahid et al. ² (2005)	Present study
Squamous cell carcinoma	93.35%	96%	94%	98.07%
Muco epidermoid carcinoma	1.71%	2.5%	-	1.92%

It is observed that squamous cell carcinoma is the commonest type of malignant tumor in oral cavity and thus its incidence is in accordance with all the studies

Table 14: show comparison of histological grading of squamous cell carcinoma

Histological grading	Jasser K. Ma'aita ¹⁵ (2000)	Patel M.M. and Pandya A.N. ¹⁶ (2004)	Present study
Well differentiated	44%	60.12%	62.74%
Moderately differentiated	42%	38.70%	33.33%
Poorly differentiated	14%	1.18%	1.96%

In the study conducted by Patel,M.M and Pandya,A.N.¹⁶ (2004) at Govt. Medical College, Surat on 504 cases of oral cancer, they found well differentiated squamous cell carcinoma as the most common histological grade (60.12%), among all cases of invasive squamous cell carcinoma which is in well accordance with present study.

The benign tumors in the present study are pyogenic granuloma, hemangioma and squamous papilloma. Also rare tumor odontogenic tumor was recorded. Among premalignant lesions, two cases were leukoplakia and dysplasia, of oral mucosa. We did not represent the complete morphological spectrum of oral cavity neoplasms, because of the limitation of period and moderate amount of study, but we studied commonly encountered oral cavity neoplasms, what our study didn't goes is rarely occurring neoplasms.

CONCLUSION:

In this study we observed that among the oral cavity neoplasms, high incidence of carcinomas are seen, among these squamous cell carcinomas are predominant. Among the squamous cell carcinomas, well differentiated squamous cell carcinoma was the commonest histological grade. Tongue was the most common site involved. Smokeless tobacco consumption was the commonest associated habit which leads to malignancy. There is a strong association is identified that various form of tobacco chewing and certain extent to smoking and alcohol drinking. Oral cancer is one of the few cancers, whose cause were known and hence it is possible to prevent. The real challenge in oral cancer lies in its prevention and early diagnosis. A comprehensive effort is needed to identify the cause of such high prevalence, generate awareness and treatment options suited to meet this challenge.

REFERENCES:

1. Mark W. Lingen. Head and Neck. In: Vinay Kumar, Abul K Abbas, Nelson Fausto, Jon C. Aster. Robbins and Cotran Pathologic Basis of Disease; 8th Edition. Philadelphia: Elsevier; 2010: 744-748.
2. Abdul wahid, Sajjad Ahmad, Mohammad sajjad. Pattern of carcinoma of oral cavity reporting at dental department of Ayub Medical College, J. Ayub Med. Coll. Abbottabad. Jan – March. 2005; 17 (1).
3. Rosai, Ackerman, Oral cavity and oropharynx. In: Michael Houston: Rosai and Ackerman's Surgical Pathology, 10th Edition. St. Louis; Mosby : 2011: 237-255.
4. Abhinandan B., Chakraborty , A., purkaystha. Prevalence of head and neck cancer in the North East, An institutional study. Ind. J. otolaryngology and head and neck Surg. 2006; Vol. 58, No. 1 : 15 – 19.
5. Sharma, R.N. : Oral carcinoma – A clinical study of 122 cases ; J. Ind. Med. Ass. ; 1964 ; 43 : 263.
6. Gopalakrishna, Saxena, Singh A.k ; Oral carcinoma ; Ind. J. Surg. 1967.
7. Thakur B.S., J.H. Makannavar; oral and oropharyngeal tumors –Clinical pathological study of 243 tumors (1991-1997) ; {dissertation}; Karnataka ; Karnataka university ; 1998.
8. Haribhakti V.V. and Mehta, A.R. Composite resection of oral cancer –experience with 97 consecutive cases. Ind.J. Cancer, 1990 ; 27 : 195.
9. Mridu Majiri, Popli, R., Paul, S., Gupta, V.P, kaholon, S.K. Prevalence of oral cavity, pharynx, larynx and nasal cavity malignancies in Amritsar, Punjab. IJO and HNS 1996;48(3):191-95.
10. Mehrotra Ravi et al., Singh , M., Kumar D., Pandy, A.N., Gupta R.K., Simha, U.S. . Age specific incidence rate and pathological spectrum of oral cancer in Allahabad. Ind. J. of Med. Sci., 2003 ; 57 : 400-4.
11. Priyanka Mahawar1, Shweta Anand2, Umesh Sinha3, Madhav Bansal3, Sanjay Dixit4. Reening for pre-malignant conditions in the oral cavity of chronic tobacco chewers national journal of community medicine 2011 Volume 2 Issue 1.
12. Saxena, O.N., Agarwal,G.R. Oral cancer- A Statistical study of 963 cases. Journal of Indian Medical Association, February, 1965; 119.
13. Krolls, S.O., Hoffman,S. Squamous cell carcinoma of the oral tissues: A statistical analysis of 14,253 cases by age, sex and race of patients. J.Am. Dent.Assoc.1976; 92:571-57.
14. 6. Alvi Aijaz , Myers, E.N., Johnson, J.T. Cancer of the oral cavity in Myers/Suen Editor, Cancer of the head and neck. W.B. Saunders, Company Philadelphia, 1996 ; 3rd Ed. 321-360.
15. Jasser, K., Ma'aita. Oral cancer in Jordan : A retrospective study of 118 pateints

- Crotian Med. J. 2000; 41 (1): 64 – 69
16. Patel, M.M., Pandya, A.N. Relationship of oral cancer with age, sex, site, distribution and habits. Indian J. Pathol. Microbiol., 2004; 2:195-197.
 17. 49. International Agency for Research on cancer, IARC Screening group, <http://screening.iarc.fr>, Home / Online screening material / A digital manual for the early diagnosis of oral neoplasia / Osteosarcoma.
 18. Rosai, Ackerman, Oral cavity and oropharynx. In: Michael Houston: Rosai and Ackerman's Surgical Pathology, 10th Edition. St. Louis; Mosby : 2011: 237-255.
 19. Bosch, F.X., Manos, M.M., Munoz, N. et al., Prevalence of human papilloma virus in cervical cancer : A worldwide prespective. Intenational Biological study on cervical cancer (IBSCC) study group. J.Nat. Cancer Inst. 1995; 87: 796-802.