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ANALYSIS OF EPIDEMIOLOGY OF ORAL HEALTH ISSUES AND IMPORTANT BIOMARKERS FOR THE ANALYSIS OF ORAL CANCER IN PAKISTAN

Hafiza Ambreen Mushtaq[1], Muizza Arshad[2], Saira Tasawar[3]

[1]Tehsil Headquarter Hospital Hasilpur

[2]Jinnah Hospital Lahore

[3]Basic Health Unit 227/9R Tehsil Fort Abbas District Bahawalnagar

Abstract:

Introduction: *Cancers of the oral cavity and pharynx account for 3% of all cancers in the United States. Oral cancer usually includes cancer of the lip, tongue, salivary glands, and other sites in the mouth; while pharyngeal cancer includes cancers of the nasopharynx, oropharynx, and hypopharynx.* ***Objectives of the study:*** *The main objective of the study is to find the important biomarkers which are used for the identification of oral cancer in local population of Pakistan.* ***Methodology of the study:*** *This cross sectional study was conducted in Jinnah Hospital, Lahore during 2018 to 2019. 5.0 ml blood sample was taken from vein. Blood was further processed for the estimation of serum biomarkers i.e glutathione and MDA. Commercially available enzymatic kits of Randox were used.* ***Results:*** *According to our data GSHand MDA shows the maximum decrease in case of tongue cancer patients. There is a maximum change observed in case of tongue cancer patient after radiotherapy.* ***Conclusion:*** *It is concluded that oral health cancer is one of the most leading cause of death in Pakistan and there are number of factors which are associated with this. But GSH and MDA are the two most important bio markers for the identification of oral cancer before and after treatment of radiotherapy in patients.*

Corresponding author:

Hafiza Ambreen Mushtaq,

Tehsil Headquarter Hospital Hasilpur

QR code

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INTRODUCTION:

Cancers of the oral cavity and pharynx account for 3% of all cancers in the United States. Oral cancer usually includes cancer of the lip, tongue, salivary glands, and other sites in the mouth; while pharyngeal cancer includes cancers of the nasopharynx, oropharynx, and hypopharynx[1]. More than 90% of oral or pharyngeal cancers are squamous cell in origin. Cancer is a leading cause of mortality and morbidity worldwide, counting for 7 million deaths per year. It is the second most common cause of death in developing countries. Cancer is the second leading cause of death worldwide, surpassed only by cardiovascular disease. Therefore, fighting cancer is measured to be one of the most significant areas of research in medicine and which possibly contributes to increased interest in chemoprevention as an alternative approach to the control of cancer. Natural or dietary factors have attracted a great deal of interest because of their safe efficacy and perceived ability to act as highly effective chemo preventive agents[2-3].

Cancer is due to failure of the mechanisms that usually control the growth and proliferation of the cell. Normally, in an adult tissue many cells do not proliferate except during healing process. Cancer occurs when normal mechanism of cell is disturbed and cells produced or divide excessively[4]. The loss of normal mechanism of cell is may be genetics or may be due to the influence of tumor-promoting chemicals, hormones and sometime viruses. There are two major lines of investigations in cancer biochemistry; the metabolism of cancer cell and the effect of cancer on the host metabolism. The cancer cell presents at least three abnormal behavior patterns, involving proliferation, differentiation and its social relationship with neighboring cells[5].

Mouth cancer (143–145 ICD-9) is a major health problem in many parts of the world. While its incidence is relatively low in most western countries there are some important exceptions to this trend: on the Indian subcontinent and in other parts of Asia it remains one of the most common forms of cancer[6]. A great deal of research is being done to learn what DNA changes are responsible for causing cells of the oral cavity and oropharynx to become cancerous. One of the changes often found in DNA of oral cancer cells is a mutation of the p53 gene[7].

Objectives of the study

The main objective of the study is to find the important biomarkers which are used for the identification of oral cancer in local population of Pakistan.

METHODOLOGY OF THE STUDY:

This cross sectional study was conducted in Jinnah Hospital, Lahore during 2018 to 2019. 5.0 ml blood sample was taken from vein. Blood was further processed for the estimation of serum biomarkers i.e glutathione and MDA. Commercially available enzymatic kits of Randox were used. Blood was centrifuged at 4000 rpm for 10 minutes and serum was separated. Blood samples will be collected into EDTA tubes from fasting proteins. The blood will be centrifuged and indomethacin and butylated hydroxytoluene will be added into the plasma samples before they will be stored at -80°C until analysis.

Statistical analysis

Student's t-test was performed to evaluate the differences in roughness between group P and S. Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

RESULTS:

According to our data GSH shows the maximum decrease in case of tongue cancer patients. There is a maximum change observed in case of tongue cancer patient after radiotherapy. The levels of GSH become decreases from 4.39±0.95 to 1.31±0.23. So, they neutralize the maximum free radicals in case of tongue cancer.

Table 01: Levels of GSH in oral cancer patients

TONGUE	CONTROL	GSH (µg/dl)			
		MALES (n=04)		FEMALES (n=00)	
	8.26	BEFORE	AFTER	BEFORE	AFTER
R1	0.00	4.26±0.00	1.25±0.00	0.00±0.00	0.00±0.00
R2	0.00	4.43±1.7	1.33±0.28	0.00±0.00	0.00±0.00
R1+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
R2+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
Total	8.26	4.39±0.95	1.31±0.23	0.00±0.00	0.00±0.00

Tongue cancer involves many factors like smoking, drinking e.t.c. According to our data MDA levels become increases in case of tongue cancer patients. The patients who received radiotherapy one time or two times shows the increase in MDA levels. MDA is considered as a important biomarker in case of tongue cancer.

Table 02: Levels of MDA in oral cancer patients

TONGUE	CONTROL	MDA(moles/ml)			
		MALES (n=04)		FEMALES (n=00)	
		BEFORE	AFTER	BEFORE	AFTER
	2.35moles/ml				
R1	0.00	4.26±0.00	5.46±0.00	0.00±0.00	0.00±0.00
R2	0.00	3.69±0.75	4.93±1.21	0.00±0.00	0.00±0.00
R1+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
R2+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
Total	2.35	3.83±0.67	5.06±1.02	0.00±0.00	0.00±0.00

DISCUSSION:

Oral cancer affects around 14.1 million people, making it one of the most prevalent cancers in the world. Developing countries, especially those from the South Asian region, have a higher burden of oral cancer compared to developed countries[8]. With an estimated increase of 13,000 new cases each year, oral cancer is the most common cancer among men and second only to breast cancer among women in Pakistan. It also has the second highest cancer related mortality rates in the country. Oral cancer thus warrants immediate public health attention and evidence based consorted efforts for its control and prevention in Pakistan[9].

At first glance, oral cancer research output in Pakistan appears to have grown exponentially over time. This growth is however relative rather than absolute, since publication numbers were very small at the beginning[10]. The growth trend in oral cancer research is in contrast to the field of clinical radiology in Pakistan, the only medical field in which research output analysis has been carried out. No differences in clinical radiology research output were seen before or after the year 2000. The general pattern of oral cancer literature growth in Pakistan however is comparable to the Indian cancer research output, where oral cancer is one of the most researched cancers due to its huge burden of disease. Oral cancer research output in both countries has seen a rapid growth post year 2000[11].

CONCLUSION:

It is concluded that oral health cancer is one of the most leading cause of death in Pakistan and there are number of factors which are associated with this. But GSH and MDA are the two most important bio markers for the identification of oral cancer before and after treatment of radiotherapy in patients.

Conflict of interest

There is no conflict of interest.

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