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Role and Recognition of Dentist as a Preventive Oncologist

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Abstract: Oral cancer ranks in the top three of all cancers in India, which accounts for over thirty percent of all cancers reported in the Country and oral cancer control is quickly becoming a global health priority [1]. Two-thirds of the global incidence of oral cancer occurs in low- and middle-income countries (LMICs); half of those cases are in South Asia. India alone accounts for one-fifth of all oral cancer cases and one-fourth of all oral cancer deaths [5]. Since oral screening and early diagnosis plays an important role in oral cancer prognosis, a dentist ability to recognize the clinical signs and symptoms is crucial [21].

Keywords: Dentist, oral cancer, preventive Oncologist, Screening.

INTRODUCTION

Oral cancer is a major problem in the Indian subcontinent where it ranks among the top three types of cancer in the country [2]. Age-adjusted rates of oral cancer in India are high that is, 20 per 100,000 population and accounts for over 30% of all cancers in the country [3]. The variation in incidence and pattern of the disease can be attributed to the combined effect of ageing of the population, as well as regional differences in the prevalence of disease-specific risk factors [4].

AIM AND OBJECTIVE

Role and recognition of dentist as preventive oncology

MATERIALS & METHODS

The most common oral tumors and their signs and symptoms in the relatively early stage

Squamous cell cancer: On average, 90% of all oral cancers are squamous cell cancers, which emerge from the oral epithelium. The remain of 10% is comprised of lymphoma, malignant salivary glands tumour, adenoid cystic carcinoma, sinonasal cancer, verrucous carcinoma, epidermoid carcinoma, malignant melanoma, multiple myeloma, soft tissue and jaw bones sarcoma, non-Hodgkin lymphoma, rare malignant odontogenic tumours, as well as metastasis tumours coming from primary cancers located somewhere else in a body [5,7].While working on the issue of primary oral cancer early diagnosis, Van der Waal and his associates offered the description for the cancer type, a patient's profile, early symptoms, early signs and precursor lesions, as well as the predilection sites for certain cancers which can help a dentist to set the right diagnosis or to recognize the suspicious oral malignancies [5].The squamous cell cancer usually emerges in patients older than 40, especially in smokers and alcohol consumers. As an early symptom, a patient can feel local irritation or pain, or pain heading towards an ear. Changes in colour and/or in texture (ulcer) are also early signs of this disease. Verrucous cancers appear in shape of a cauliflower and they can emerge anywhere in the oral cavity. However, their prognosis is better than that of the deep ulcerative lesions of the same size [6]. Among the possible oral cancer symptoms it is important to mention that the most frequent ones are pain or stupor, sudden teeth mobility without a visible cause, teeth loss, extraction socket or mouth inflammation that is not healable, chronic ear pain, lateral neck lumps, tissue fixation to the deep or surface mucosa, swollen lymph nodes, difficulties in swallowing- dysphagia and body weight loss [8, 10].Predilection sites for the oral cancer are ventral and edge sides of the tongue (40%), floor of the mouth (30%), lower lip, retromolar triangle, buccal mucosa as well as the maxillary and mandibular gingiva [5–7,11]. These regions are covered in thin, non-keratinized mucosa, which is more susceptible for cancerogens than the keratinized mucosa [12]. In the study which included 3526 patients, Waldron and Schafer pointed out the risky locations such as floor of the mouth and ventral side of the tongue [7]. The tendency towards squamous cell cancer emergence is especially high in per-sons with a rather white complexion [5]. Considering the lip region, it is the lower lip that is usually infected by the disease and it usually appears in male patients. The mortality rate among the oral cancer

patients depends on the localization and disease stage. The highest morality rate is detected among the patients with the cancer located on their tongue or sublingual area, while the lowest morality rate is detected among the lip cancer patients [5]. It is important to know that the oral cancer is painless in its early stage and that this is the main reason that a patient does not visit their doctor. The majority of patients feel the pain in lesions only when it undergoes a secondary infection. Among other symptoms we can find difficulties in chewing, swallowing, tongue and mandible movement as well as stupor in tongue and other oral cavity regions. These changes appear when the tumour infiltrates into neighboring muscles and nerves. If it is not treated, it can expand over the lymph nodes and thus leading to lymph nodes swelling [5].

Lymphoma:-The next on the list of the most common malignant oral cavity tumour after the squamous cell carcinoma is lymphoma [6]. The most commonly affected regions are tonsillar region, gingival and hard palate [13].

Tumor of salivary glands:-The next most common oral cavity tumour is the salivary glands tumour [13]. Oral cavity is rich in small salivary glands, so this tumour kind should be taken into consideration during the differential diagnosis, especially if the tumour is located in retromolar region, on the palate or on the floor of the mouth [11, 12]. Malignant intraoral tumour of the salivary glands usually emerges in adult patients. Its etiology is unknown. Usually there are not any visible symptoms. The soft tissue swelling appears as the early sign of this disease but it is important to note that sometimes this symptom does not appear at all. Predilection sites for this kind of tumour are palate and the upper lip [5].

Black lesions: - Black lesions, such as melanoma, usually emerges in adult patients. Its etiology is not known. Symptoms are usually not visibly expressed. Early signs could be pigmented swelling with or without ulcerations. Predilection sites are palate and gingiva of both jaws [5].

Sarcoma:-Jaw bone sarcoma emerges in patients regardless of their age with unknown etiology. If the sarcoma is located in the mandible, then lower lip paraesthesia appears as an early symptom. Bone swelling and X ray changes appear as early signs of this disease. There are not any predilection sites [5].

Non Hodgkin lymphoma:-Non Hodgkin lymphoma usually emerges in adult patients and its etiology is unknown. Early symptoms do not appear and, in case they do, they are usually manifested as the lower lip paraesthe-sia. As the early signs of this disease we can find mucosa swelling, with or without ulceration, and intraoseal location of X ray changes. Lymphoid hyperplasia is being mentioned as a precursor lesion. Predilection sites for this lymphoma are mandibular bone and upper jaw soft tissue [5]. The worst prognosis in oral tumours cases is noted in malignant melanoma and sarcoma patients [7]**.** However, it should be pointed out that none of the signs and symptoms is pathognomonic signs of malignancy. This is the most probable reason why almost half of the cancer cases in the world are being discovered in their progression stages, actually third and fourth stages [14,21].

Screening and Early Detection:- The fact that the oral cavity is accessible for visual examination, and that oral cancers and premalignant lesions have well-defined clinical diagnostic features, oral cancers are typically detected in their advanced stages. Screening should be differentiated from case finding, which is used for patients who have abnormal signs and Screening should be differentiated from case finding, which is used for patients who have abnormal signs and symptoms with the goal of finding the diagnosis and plan appropriate therapy [17, 21].

Oral Screenings Is Described

- Conventional oral examination (COE):-Oral cavity is easily available for the examination which enables the dentists to detect the oral cancer in its early stage. However, a time period between the appearance of the first signs of the disease and the diagnosis establishment is usually very long. This happens because the clinicians do not have any suspicions about the disease being malignant or they simply do not recognize premalignant conditions. That is why it is of the crucial importance for dental clinicians to have a unique methodical approach while performing the examination on the patients. Thus, a dental examination should encompass examination of the lips oral mucosa, tongue, alveolar mucosa, floor of the mouth, palate, cheeks and the oropharynx examination [6]. In other words, the oral mucosa examination should be the integral part of the dental check-up [15]. Currently, the accepted doctrine in oral cancer and premalignant conditions detection is the conventional clinical examination [15].

- Brush biopsy:-Oral brush biopsy, also known as OralCDx® Brush Test (Odx Laboratories, Inc., Suffren, NY, USA) was introduced into practice in 1999, with the goal of examining clinically harmless lesions that can potentially lead to dysplasia and oral cancer. The sample is taken by rotating the brush on the chosen place until redness and hemorrhagic spots appear. This approach leads to a represen-tative sample which contains all layers of epithelia (superficial, intermediate and basal). The sample is subsequently placed on the slide, fixed and sent to OralDx laboratory, where it

is analyzed using computer based imaging system[16].

- Toluidin blue staining:-Toluidine blue staining (TB) or tolonium chloride is a vital stain for nucleic acids and abnormal tissues. It is used in diagnostics of cervical and oral mucosa for a long time. Lately, there has been an increased interest in the use of this stain. TB is primarily used to detect fast cellular proliferation that is seen in carcinoma in situ and high grade dysplasia because those lesions have the highest content of nucleic acids compared to normal tissues [16].

- Light based detection systems:-The use of various light based detection systems in screening for oral cancer is based on the assumption that structural and metabolic changes in the mucose during carcinogenesis leads to differential light absorption and refraction after the cancerous tis-sues are exposed to various types of light or energy.

- Chemiluminescence: - Chemiluminescence method is based on the light emission dur-ing chemical reaction. The most common methods that uses this principle is ViziLite® sistem (Zila Pharmaceuticals, Phoenix, AZ, USA). It was introduced into practice in 2002.

- Tissue fluorescence imaging:-Tissue fluorescence imaging is the light based method that utilized the tissue autofluorescence that emits fluorescence after being stimulated with intensive light. The principle is such that normal and abnormal tissues emit different fluorescence. After the exposure to the blue light (400–460 nm), normal mucosa emits pale green autofluorescence. Areas with epithelial dysplasia or SCC have decreased levels of autofluorescence and look darker from surrounding healthy tissues. The device that uses the tissue flu-orescence is called VELscope® (Visually Enhanced Lesion Scope; LED Dental Inc., White Rock, BC, Canada) and has been in prac-tice since 2006 [16,21].

- Tissue fluorescence spectroscopy:-This method can be considered as an upgraded version of the previously described methods. It is a newer method that relies on the use of optical fiber that emits light on the tissue, which consequently fluoresces. That fluorescence is recorded on the spectrograph and analyzed using computer software [16,18,21].

- Salivary analysis:-The use of saliva as a noninvasive screening in the detection of oral cancer lies on the principle that the content of saliva is changed in patients with oral cancer. Significant abnormalities in the level of salivary parameters sensitive to oxidative stress, epithelial tumour markers such as CYFRA 21-1, tissue polypeptide- specific (TPS) antigen and various RNA transcripts (e.g. insulin like growth fac-tor, MMP-2, MMP-9, interleukin-8 and interleukin-1B) were found in patients with oral cancer. These biomarkers can be of use in diagnosis, prognosis and postoperative monitoring of oral cancer. However, it is necessary to prove that salivary analysis is cost effec-tive for this purpose [16, 19, 21].

Summary &Conclusion

The greatest threat of the oral cancer burden exists among the lower socioeconomic strata. This segment of the population is the most vulnerable because of higher exposure to the risk factor tobacco which complicates the situation further. They have the most limited access to education, prevention and treatment. Value of the screening programme does not need to be restricted on the oral cancer detection but it can also be extended on raising the patient's awareness of the fact that the alcohol and tobacco consumption are associated with the emergence of this disease. This could play a very important role in the cancer prevention [20, 21]. Dentists play a very important role in noticing suspicious areas or lumps, which can potentially be diagnosed as oral cancer. The role of a dentist in diagnosing oral malignancies, especially oral cancer, or preventing the oral cancer is invaluable and usually of vital importance [21].Thus I conclude that the dentist should be consider for preventive oncologist and would be great strength to the society and to team of oncology and especially preventive Oncology in preventing the oral cancer.

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