



Biosensors: Molecular Probing Rejuvenated - A Meta Analysis Research

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Abstract

Aim of the Study: To statistically demonstrate the enhanced significance of BIOSENSORS over other comparative investigative procedures for detection of Oral Potentially Malignant Disorders (PMDs) over a decade's timeperiod.

Methodology: Study sample included research articles, based on databases from the COCHRANE collaboration having undergone a definite Randomised Control Trial, on various investigative procedures for Oral Precancer Lesions and Conditions and Oral Cancer itself over the past decade. This included literatures on Toluidine blue, Lugol's iodine, Vizilite, Velscope, Colposcopy and Biosensors. The literature was, assessed analysed and studied, comparison was made based on the various p-values between various techniques on one side and biosensors on the other in terms of sensitivity and specificity. A Meta Analysis of all the modalities including the above mentioned parameters was carried out and advantages and disadvantages documented and compared with those of Biosensors in order to demonstrate the title of the study.

Result: Compared to the 100% sensitivity and specificity of biosensors, the sensitivity and specificity of vital staining techniques were found to be respectively 95% and 81%, whereas the sensitivity and specificity of visual aids were found to be respectively 86% and 78%.

Conclusion: Biosensors definitely came up as the best diagnostic aids and investigative procedures at hand compared to all others existing or tried so far.

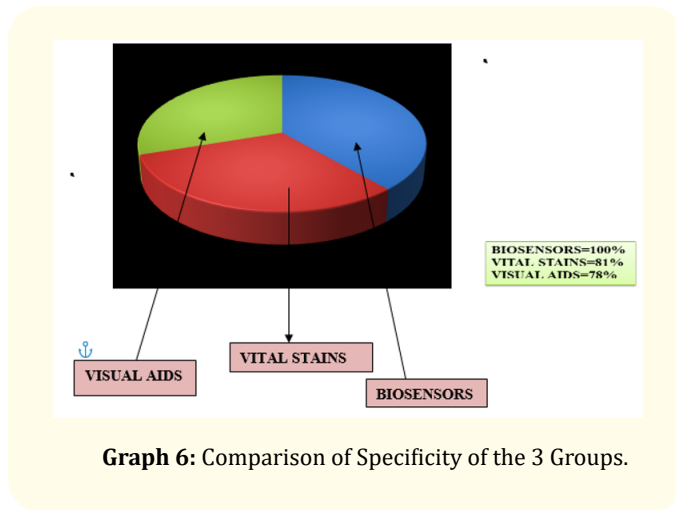
Keywords: Biosensors; Meta Analysis; Randomised Control Trials; Sensitivity; Specificity

Introduction

Oral cancers, as all of us are aware are one of the most significant human maladies in our history. The alarming epidemiological data of various cancers of the human body including the oral cancers ranking 6th amongst all, have been disheartening in the literatures existing so far. It is estimated that there are almost three lakh cases of oral cancer reported worldwide in literature to claim numerous lives annually [1,2]. This malady has been an enigma

not only to the patients but also the professionals (oral surgeons, physicians and oncologists) because cancer is not a disease of a patient alone, but the entire family (physically, psychologically and socioeconomically).

Presently cancers are being diagnosed very late usually at the untreatable stages, thereby increasing the morbidity and mortality rates bringing down the 5 year survival rate drastically [3,4]. Hence



Graph 6: Comparison of Specificity of the 3 Groups.

The Meta Analysis graphical representations are depicted after the reference section later in this article.

Discussion

Biosensors work on the principle that the tumors or the cancerous cells elaborate specific onco proteins which can circulate through the bloodstream and can be picked up even at minute concentrations [1,5,8]. These onco proteins are characteristic and are called BIOSENSORS. Biosensor devices are specially designed to detect biological entities by converting biomolecular signals into electrical signals which is further analyzed. This technology has the potential to provide fast and accurate detection which are reliable in, imaging of cancerous cells, monitoring angiogenesis and cancer metastasis [3,7,16].

Staining techniques and other visual aids have been used routinely as early diagnostic tools to pick up Potentially Malignant Disorders. The concept and technology is based on genetic and morphological changes ie changes which have already caused oncoconversion [7-17].

Therefore difference between the above 3 groups is that the Biosensors pick up early biochemical onco conversions whereas other 2 groups pick up functional and morphological conversions. In terms of onco conversion, biosensors prove to be the most significant of all and the same has been proven by our Meta Analysis results.

Conclusion

The development of biosensors is probably one of the most promising ways to solve some of the problems concerning the increasing need to develop highly sensitive, fast and economic methods of analysis in early detection of cancers.

In this regard, biosensors come up as the best weapons of choice in the future of fight against oral cancers.

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