



**“APPLICATION OF IN VIVO STAIN OF METHYLENE BLUE AS A
DIAGNOSTIC AID IN THE EARLY DETECTION OF POTENTIALLY
MALIGNANT AND MALIGNANT LESIONS OF ORAL MUCOSA”**

BY

DR. LIJOY ABRAHAM

Dissertation Submitted to the
Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

In partial fulfillment
of the requirements for the degree of *7.831*

MASTER OF DENTAL SURGERY (M.D.S)

In

ORAL MEDICINE & RADIOLOGY

Under the guidance of
DR. KRISHNA N BURDE
PROFESSOR



**DEPARTMENT OF ORAL MEDICINE & RADIOLOGY
S.D.M. COLLEGE OF DENTAL SCIENCES & HOSPITAL,
Dharwad
2011**

ABSTRACT

BACKGROUND & OBJECTIVE: In vivo stains are the prompt resources, which have emerged in recent years so as to aid as clinical diagnostic tools in detecting early potentially malignant and malignant lesions. Toluidine blue by its property of retaining in the increased DNA and RNA cellular activity areas, aids in delineating the suspicious areas. However, it is hazardous if swallowed, and was shown to have toxicity to fibroblasts. Methylene blue has a similar chemical structure and exhibits similar physicochemical properties to toluidine blue. It is less toxic to the human body and has recently been proposed for screening some gastrointestinal or prostate tumors. The application of this material in detecting oral lesions has so far not been addressed.

The objective of this study was to evaluate the sensitivity and reliability of *in vivo* staining with methylene blue as a diagnostic adjunct in screening for oral malignant or potentially malignant lesions.

METHODS: The present study involved the examination of seventy five patients suspected of having oral malignant or potentially malignant lesions by methylene blue staining. The results of methylene blue uptake were compared with a simultaneous biopsy of these lesions. The pathologically confirmed dysplastic and oral squamous cell carcinomas were the positive targets of this screening, while non dysplastic lesions were sorted as negative subjects of screening.

RESULTS: Fifty-five of 58 pathologically proved malignant/potentially malignant lesions were positive with deep and focal methylene blue staining. The overall sensitivity was 95% (100% for malignancy and 92% for potentially malignant lesions). In the aspect of specificity, we obtained a value 70% (12/15) with a resulting false-positive rate of 30%. The positive predictive value was 91% and negative predictive value of 80% was observed in the study.

CONCLUSION: We consider that methylene blue staining is a useful diagnostic adjunct in a large, community-based oral cancer screening program for high-risk individuals. Further studies with more number of cases and longitudinal studies are required to draw substantial conclusion.

KEY WORDS: Methylene blue, oral malignant, potentially malignant