

An Insight in to Prevalence of Binucleated Squamous Cells in Buccal Smear by Methylene Blue Staining

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Abstract: - Examination of buccal smear is a simple and cost effective method to detect any nuclear abnormalities. The squamous cells of the buccal smear may show nuclear variations in shape, number, micronuclei reflecting any underlying pathology or exposure to genotoxic contaminants or familial or radiation effects due to excessive smartphone use. The present study is done to determine the nuclear abnormalities taken from the buccal smears of medical and dental students. Buccal smears from 25 boys and 25 girls of first year medical and dental students were collected on clean slides, after taking informed consent. Each smear was heated over a bunsen burner for a while and stained with methylene blue using the standard procedure. The smears were observed under the light microscope under low and high power. Photographs were taken which showed binucleated squamous cells. The entire study was done in the central research lab of the institute. 2 smears showed binucleated cells, discarding the other nuclear abnormalities. The nuclei were two in each cell at two places in one smear and in one field in other smear. Buccal smear examination is a cost effective and easy procedure to identify any nuclear abnormalities that reflect underlying pathologies. The presence of binucleated cells in the buccal smear explains the need for further analysis in the two cases.

Key Words: — *Buccal smear, methylene blue, binucleated cells, medical & dental students.*

I. INTRODUCTION

Buccal smear shows exfoliated squamous cells which can be examined for nuclear abnormalities in the form of shape, number, presence of micronuclei and additional nuclei. The occurrence of nuclear variations may be attributed to the exposure of the individual for genotoxic contaminants, occupational toxicants, environmental pollutants, familial, underlying pathologies or radiation effects like excessive mobile use. Many studies show the nuclear variations due to chemotoxic substances which are classified as an occupational hazard. Guthrie et.al. (1) described the harmful effects of mineral dust on human health. The micronucleus test was employed on buccal cells by Sarto et.al. (2) and scientifically proven by Nersesyan (3). A study on cytogenetic damage was done by Chen et.al (4) and due to pesticides was detailed by Pastor et.al. (5). The nuclear damage was even caused by calcite dust as stated by Diler et.al. (6). The present study was done to detect any nuclear abnormalities in buccal smears of medical and dental students.

II. MATERIALS AND METHODS

After taking informed consent, 50 students of first year MBBS and BDS participated in the study. 25 girls and 25 boys of age group 17-22 years formed the study group. The

procedure of taking a buccal smear was clearly explained. The inner aspect of buccal mucosa was scraped with a spatula and a smear was prepared. It is then heated over a bunsen burner for a while to make it dry. Now 2-3 drops of methylene blue were added to the smear and kept dry for a minute and then washed under running water. After drying, the smear was observed under a light microscope, first in low power and then in high power. Five fields were observed for each slide. A total of 50 slides were examined. Any abnormality detected was captured with a mobile.

III. RESULTS

Each slide is examined under low and high power. 2 slides showed binucleated cells. The following pictures show the methylene blue stained buccal smear and the presence of binucleated cell in two cells.

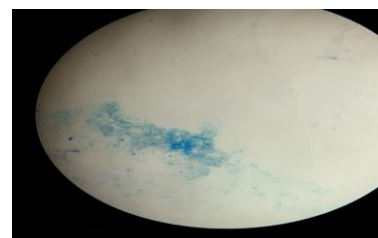


Fig.1. buccal smear in methylene blue staining- light microscopic view

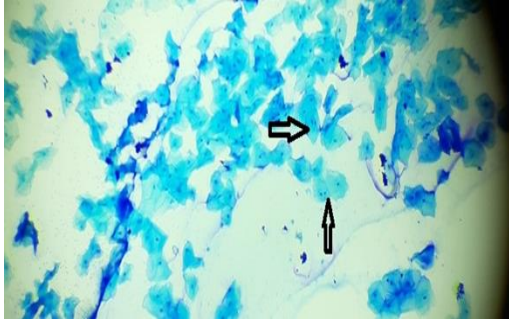


Fig.2. Binucleated cells in low power magnification.

IV. DISCUSSION

The presence of binucleated cells in the buccal smear has been implicated as a cause of underlying pathologies or exposure to genotoxic contaminants. Ozkul et al.⁽⁷⁾ described the variations in smokers, Ramirez et al.⁽⁸⁾ illustrated in alcoholics. Similar effects were shown by Donbak et al.⁽⁹⁾ in his study on coal miners. Formaldehyde exposure also seemed to be a genotoxic contaminant as concluded by Speit et al.⁽¹⁰⁾. Many studies have been done to determine the underlying effects of the nuclear abnormalities. The present study has been done to detect the presence of nuclear abnormalities focussing on the number of nuclei in the squamous cells. Binucleated cells have been discovered in two smears taken from medical and dental students. The students were advised for further evaluation to determine the underlying cause.

V. CONCLUSION

Binucleated squamous cells were detected in two buccal smears done by simple methylene blue staining. One slide showed two cells with binucleated cells. The students were advised for further evaluation.

Conflict of Interest: none

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