

# FORMALDEHYDE'S GENOTOXIC EFFECTS IN PATHOLOGY ANATOMY TECHNOLOGISTS AND MEDICAL PATHOLOGISTS

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## INTRODUCTION

Formaldehyde (FA) had been considered to be carcinogenic by the International Agency for Research on Cancer (group 1), on the basis of sufficient evidence both in humans and in experimental animals, making it a subject of major environmental concern, especially in the occupational context. Manifold *in vitro* studies clearly indicated that FA is genotoxic, inducing various genotoxic effects in proliferating cultured mammalian cells.

Cytokinesis-blocked micronucleus (CBMN) assay is used extensively in molecular epidemiology, and the chromosomal alterations most reported and studied by the CBMN are: micronucleus (MN), nucleoplasmic bridges (NPB) and nuclear buds (NBUDs).

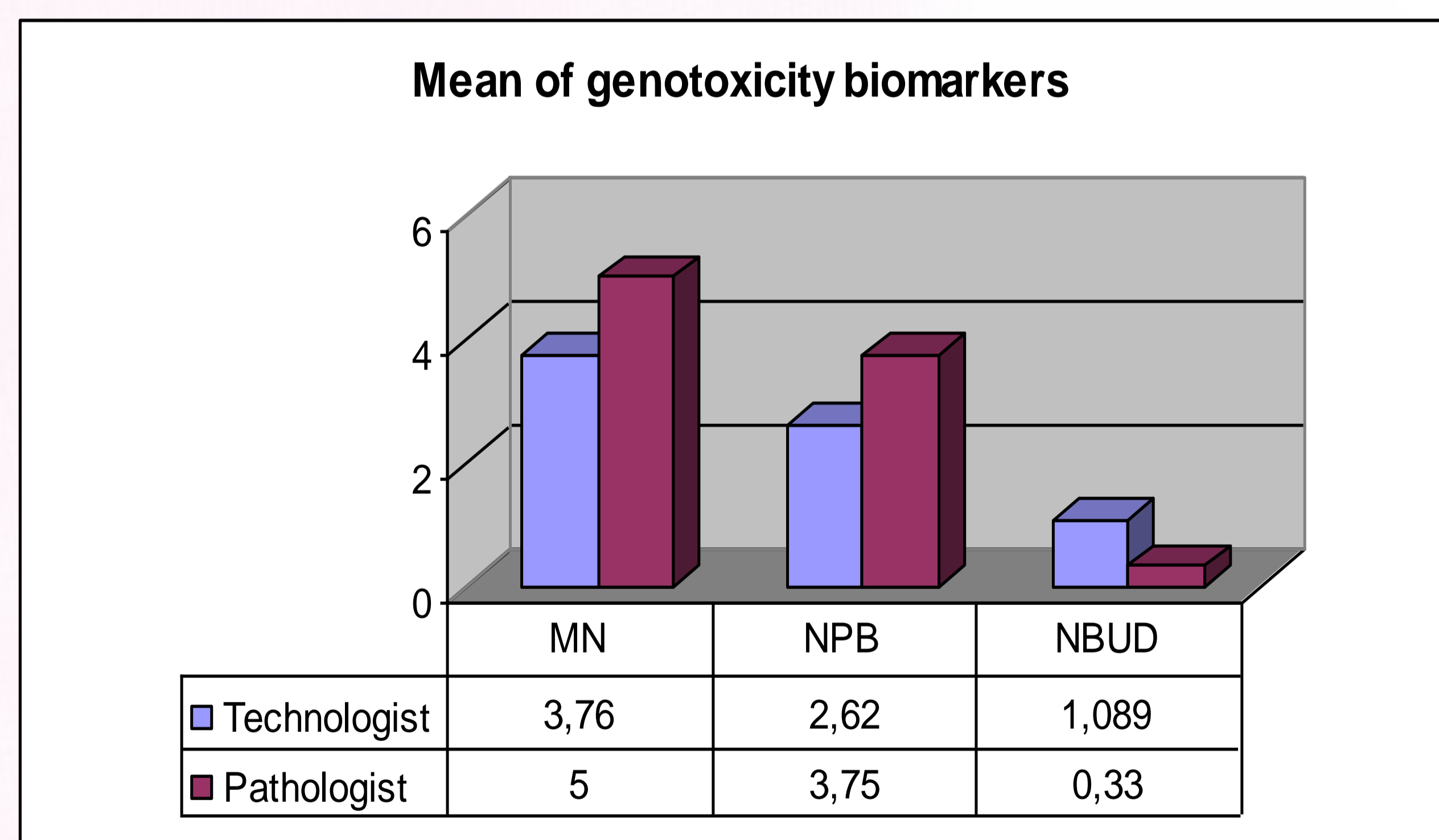
The pathology anatomy laboratories are workplaces that manipulate routinely FA and pathology anatomy technologists and pathologists contact daily with this chemical compound particularly in the macroscopic exam and grossing procedures.

The **AIM** of this study was to identify genotoxicity biomarkers in these two workers groups, such as micronucleus (MN), nucleoplasmic bridges (NPB) and nuclear buds (NBUD) in peripheral blood lymphocytes.

## METHODOLOGY

Exposure assessment was performed by applying simultaneously two methods in pathologist and technologists groups. In one method, environmental samples were obtained by personal air sampling with low flow pumps during a typical working day. FA levels were measured by gas chromatography and time-weighted average (TWA) estimated according to NIOSH 2541 method. The second method measured ceiling values of FA using Photo Ionization Detection equipment with simultaneously video recording. Measures were performed in each task and instantaneous values for concentration were obtained on a per second basis. The blood was obtained by venipuncture from 34 technologists and 12 pathologists and it was performed the multi-endpoint CBMN assay that allow to identify the nuclear abnormalities above described in lymphocytes.

## RESULTS



TWA was higher in technologists group but ceiling values were higher in pathologist group. None of TWA results were higher than OSHA reference value (0,75 ppm) but all the exposure groups have activities with results higher than the ACGIH reference value (0,3 ppm). All the biomarkers were compared previously with non-exposed subjects and the results were found to be statistically significant (Mann-Whitney test,  $p < 0.002$ ).

## CONCLUSIONS

All biomarkers measured in lymphocytes had higher means in pathologists compared with technologists. This result can be explained by the exposure to higher concentrations of pathologists that perform macroscopic exam. Also this chemical mode of action is more related with the concentration than with time of exposure expressed by TWA results.