Ain shams University
Faculty of Women for Arts,
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STUDIES ON MICROSOMAL EPOXIDE HYDROLASE (mEH) GENE POLYMORPHISM, DNA DAMAGE, ANTIOXIDANTS ACTIVITIES IN WOODEN WORKERS

Thesis Submitted for the partial fulfillment
for
M.Sc. Degree in Zoology

by
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بسم الله الرحمن الرحيم

قالوا سبحانك لا علم لنا إلا ما علمتنا
إنك أنت العليم الحكيم

صدق الله العظيم

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Abstract

Occupational exposure to wood dust causes a numerous harmful effects on workers 'health.

Present study included fifty workers exposed to wood dust and fifty healthy subjects. Both groups were divided according to ages into four subgroups, age ranges 20-25, 25-30, 30-35 and 40-55 years. In addition, exposed workers subgroups were classified according to duration of exposure to wood dust into 5, 10, 15 and 20 years. Our study aimed to configure out the effects of wood dust exposure on antioxidants status and oxidative stress as well as its genetic effects among exposed workers. That was performed through determination of antioxidant enzymes activity (SOD, GPx and CAT), serum MIP-2 (as marker of oxidative stress). Levels of genetic damage using the comet assay and gene polymorphism of microsomal epoxide hydrolase EPXH1 were assessed (exon 3 and exon 4) by polymerase chain reaction (PCR-RFLP).

The results revealed significant reduction ($P < 0.003$) either in levels of CAT or SOD enzyme activity among exposed workers for different exposure duration(5,10,15 and 20 years) in comparison with healthy group. Significant rise in MIP-2 serum level ($P<0.001$) among workers exposed to wood dust for different duration exposure (5,10,15 and 20 years). Also, comet parameters results recorded a significant elevation in tail length, %DNA and tail moment ($P<0.001$, 0.001 and 0.001 respectively) among exposed workers for exposure duration 20 years.

Significant difference in genotype frequency of EPHX of polymorphism at exon 3 ($P< 0.047$) and exon 4 ($P=0.05$) was seen

among exposed workers for different duration exposure (5, 10, 15and 20 years) compared with healthy groups.

So, it was concluded that exposure to wood dust for different duration had harmful effects as significant reduction in (SOD and CAT) antioxidants levels, in addition to increasing levels of genetic damage.

Thus, it was recommended to estimate levels of catalase, SOD enzyme and genetic polymorphism of EPHX (exon 3) and (exon 4) periodically for these workers. In addition, increased health education for these workers about the potential hazard of occupational exposure and the importance of using protective measures.

Key words: Wood dust, mEH polymorphisms, genetic damage, MIP-2, SOD, CAT.

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