

CHAPTER 6

Conclusion

Studies based on the enzyme assay, micronucleus test and comet assay indicated that the pesticides are capable of exerting toxic effects on the pesticide-exposed individuals evidenced by the lower levels of acetylcholinesterase and butyrylcholinesterase activity and increased DNA damage compared to the non-exposed (controls), smokers and alcohol consumers.

Significantly lower activity of acetylcholinesterase and butyrylcholinesterase in the pesticide-exposed tea garden workers indicated marked inhibition of the enzymes. Acetylcholinesterase and butyrylcholinesterase activities were not significantly reduced in any particular age group in the present study, however slightly lower activities observed in the 15-30 years age group reflect that these individuals might be engaged in the activities with greater risk. The gender has very insignificant or no effect on acetylcholinesterase and butyrylcholinesterase activity.

Higher frequency of micronuclei and other cell death parameters (cells with nuclear bud, binucleated cells, karyorrhectic cell, pyknotic cell, karyolytic cell) in the pesticide exposed individuals than control subjects indicated greater extent of genome damage induced by pesticides. Marked increase of micronucleus and other cell death parameters in the tea garden workers compared to the smokers and alcohol consumers indicated that smoking and alcohol consumption may act synergistically with the pesticides to cause increased DNA damage. Age has no significant effect on the frequency of micronucleus and other cell death parameters. Significantly higher frequencies of micronucleus, nuclear bud and binucleated cells in male workers than females clearly indicated a sex bias which could be due to the sum of different factors like smoking, alcohol consumption, the intensity of pesticide exposure which is not uniformly distributed between sexes.

Significantly longer comet tail length, tail moment and olive tail moment in the pesticide-exposed individuals compared to the controls, smokers and alcohol consumers suggested higher level of DNA damage induced by the pesticides.

CYP2C9 allele frequency and the related genotypes were not found to differ significantly between the pesticide-exposed tea garden workers and non-tea garden workers.

However, from the study of different biomarkers, it can be concluded that the tea garden workers are at very high risk of occupational exposure.