014A

A Study on chronic exposure to organophosphates among pesticide sprayers employed by municipal councils

C A Muller[1], C Deepal Mathew[1*], S Jayasingha[2], E Valemurugam[2], Thanuja Nandadasa[2] and S Gunasekara[3]

[1] *Department of Biochemistry Medical Faculty University of Colombo*

[2] *Department of clinical Medicine University of Colombo*

[3] *General Hospital Colombo*

People exposed to organophosphates sufficiently to depress plasma or erythrocyte cholinesterase, perform significantly worse in a broad region of neuro behavioral test. Available evidence suggests that there is a high probability of adverse health effects due to low level chronic exposure to organophosphates. Pesticides sprayers employed by the Colombo Municipal Council and Dehiwela/ Mount Lavinia Municipal Council were tested to determine whether they were effected by chronic organophospate poisoning.

Among the 93 pesticide sprayers who were tested 43% had plasma cholinesterase activity below the normal range (3500 – 8500 U/L). Their enzyme activity varied from 448U/L to 3476 U/L. These values were between 13% to 99% of the low value in the normal range. 63%. Persons were below 80% of the normal range and 23% persons were below 50% of the normal range. None were below 10% of the normal range. Considering the sprayers who were below the normal range in their plasma choline esterase activity 53% consumed alcohol. Liver function test performed on these persons showed that 8% had high Aspartate transaminase activity, 8% had high Gamma glutamyl transpeptidase and Aspartate transaminase activity and 3% had high Gamma glutamyl transpeptidase, Aspartate transaminase and Alanine transaminase activity. However, the increases were marginal and therefore would not contribute to lowering plasma cholinesterase activity. Dibucaine studies indicated above 80% inhibition for all subjects. Therefore, all of them were normal homozygotes. The mean body mass index (BMI) was 18.9 kg/m^2,S.D +/- 3.2 The normal range for BMI is 18.5 to 29.0 kg/m^2 58% had BMI below 18.5 k/m^2.The mean Hemoglobin content was 15.4 g/dL, S.D+/-1.8. The Hemoglobin content varied from 12.6 to 18.9 g/dL. 38% had Hemoglobin levels lower than the normal range (14.0 – 18.0 g/dL). However, the decrease in hemoglobin and BMI levels was between 10 -15% levels of the normal range such decreases will not effect cholinesterase activity. Therefore, the nutritional status and the Hemoglobin content of the individual did not effect the lowering of the plasma cholinesterase activity.

Considering the above result the decrease in plasmacholinesterase activity is due to chronic exposure to organophosphates. Clinical neurological examination of the persons with low plasmacholinesterase activity was normal and the neurophysialogical studies failed to show any evidence of a neuropathy or myopathy.These results are in agreement with the work done by other researchers, as above 80% decrease in plasma cholinesterase activity is required to bring about clinical symptoms.

Tel: 011 2697485