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OP 010

Serum Paraoxonase1 May Protect From Intermediate Syndrome in OP Poisoning.

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Abstract

Objectives: Serum Paraoxonase 1 (PON1) may protect humans from neurotoxic effects of OP's. Enzyme activity varies widely between persons because of a genetic variability. The serum levels of this enzymes and aryl esterase were measured and correlated with the occurrence of intermediate syndrome (IS) in patients presenting with Organophosphate (OP) self- poisoning.

Methods: Patients: Consecutive 99 OP self-poisoning cases who presented to our hospital who were more than 15 years of age and with BChE levels <3000 U/L were recruited in the study after informed consent. There were 69 males and 30 females. The median age in the males was 27 years (15-74) and in the females was 24 years (16-90). Phenylacetate is used as a substrate for the arylesterase assay and paraoxon for the PON1 assay. The three phenotypes of PON1 can then be differentiated by the ratio of paraoxonase/arylesterase activity. The QQ phenotype has a ratio of < 5; QR is 5-11, RR> 11.

Results: The median PON activity in 99 subjects admitted was 212 U/L (61-516). The QQ phenotype was present in 83% and QR phenotype 17%. No one had the RR phenotype. A higher median PON1 activity was observed in patients who survived as compared to those who died,but it was not statistically significant (Died- 172.3; 103.3-380.4 U/L vs Alive- 223.4; 60.8 – 516.5 U/L , p=0.33).Forty six subjects developed intermediate syndrome(IS). Patients with PON1 QQ genotype had higher occurrence of IS when compared to the QR genotype (QQ-39%, vs QR-0%; p= 0.033). Patients with a lower median PON1 activity (182.1U/L; 60.8- 327) were more prone to develop IS as compared to patients with higher median activity (269.9U/L; 71.8-516.5) (p=0.042)

Conclusions: PON1 is a major OP detoxifying enzyme and the QQ phenotype has a lesser metabolizing capacity and activity than QR phenotype. Patients who had a QQ phenotype were more prone to developing IS. None of the patients with QR phenotype developed IS. Patients with a higher the PON1 activity appeared to have less chance of developing IS. We can

speculate that a higher detoxification capability may render higher protection due to lower concentration of active toxin reaching target tissues.