OP 009

The Relationship between Paraoxonase-1 and the Condition of Organophosphate Poisoning

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Abstract

Objective: In this study, we detected the serum paraoxonase-1 activity of organophosphate poisoning patients.Our data suggested that paraoxonase-1 could assess the severity of organophosphate poisoning patients. A positive correlation was found between serum paraoxonase-1 activity and cholinesterase activity among pesticide consumed subjects.

Methods: 62 pesticide poisoned cases who were admitted for acute poisoning with pesticides in the emergency department of the third affiliated hospital of Shenyang Medical Collage from July 2013 to January 2014 as study group. All of them are not suffering from coronary artery disease, hyperlipidemia, cerebral vascular accident and liver disease.According to their clinical symptoms, signs and cholinesterase activity, the study group was divided into three levels: 18 cases in mild poisoning group, 23 cases in moderate poisoning group and 21 cases in severe poisoning group.In addition, 40 healthy cases were chosen from the physical examination in the same period as control group. Blood serums of all cases were drawn and kept frozen at –80℃ for future use.Hitachi 7180 automatic biochemical analyzer was used for measuring blood cholinesterase and paraoxonase-1 activity and using butyrylthiocholine and paraoxon as substrates respectively. Statistical analyses of the data were performed using SPSS19.0 software.

Results:

1. The changes of paraoxonase-1 activity and cholinesterase activity in organophosphate poisoning patients: Compared with the control group, the paraoxonase-1 activity and cholinesterase activity in organophosphate poisoning patients significantly decreased. The differences were statistically significant ($P<0.01$).Compared among three poisoning groups, the paraoxonase-1 activity and cholinesterase activity gradually decreased following the increasing severity of organophosphate poisoning condition. The differences were statistically significant($P<0.05$).

2. The correlation between the blood cholinesterase and paraoxonase-1 activity in organophosphate poisoning patients: There was a significant positive correlation between the blood cholinesterase and paraoxonase-1 activity （r=0.886，ν=60）. The differences were statistically significant (P=0.000).

3. The area under the ROC curve of paraoxonase-1 and cholinesterase were 0.911 and 0.952 respectively,indicating that paraoxonase-1 had a very high accuracy in the diagnosis of organophosphate poisoning.

4. Conclusions: In this study, our results showed that the paraoxonase-1 activity significantly decreased in organophosphate poisoning patients and gradually decreased following the increasing severity of organophosphate poisoning condition. Moreover, there was a significant positive correlation between theblood cholinesterase and paraoxonase-1 activity. Therefore, this study suggests that paraoxonase-1 can be used for determining the severity of organophosphate poisoning.