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## Background

- Pesticide exposure is a major occupational hazard in agricultural workers.
- Organophosphates (OPs) are most frequently used pesticides in agriculture.
- OPs are potent inhibitors of acetylcholinesterase (AChE).
- OPs in the blood are rapidly metabolized by paraoxonase-1 (PON1) which is found associated with high density lipoprotein in the blood.

## Aim

To study the status of the activity of erythrocyte AChE and serum PON1 in agricultural workers exposed to pesticides.

## Methods

- 60 agricultural workers involved in pesticide application and 60 age and sex matched control subjects were recruited from the villages of Magway Township.
- Erythrocyte AChE activity was determined by Ellman's method.
- Serum PON1 activity was measured by Eckerson's method

## Results

Table (1) Demographic data of the subjects

	Control group (n=60)	Agricultural workers (n=60)	p value
Age (years)	36.6 ± 11.2	36.5 ± 8.5	0.92
Gender	males	males	
Duration of farming experience (years)	-	15.6 ± 9.8	

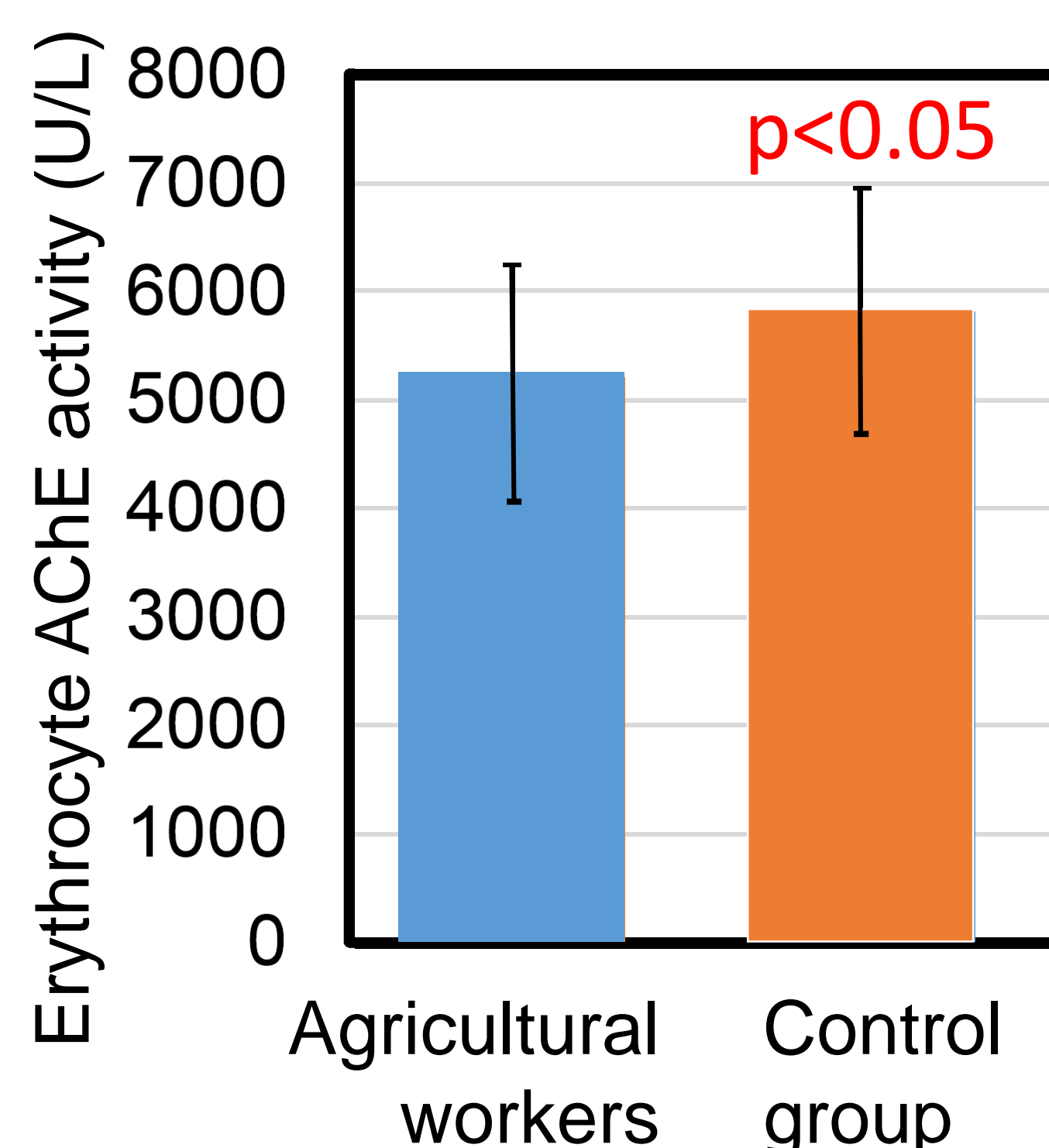


Fig.(1) Comparison of erythrocyte AChE activity between agricultural workers and control group

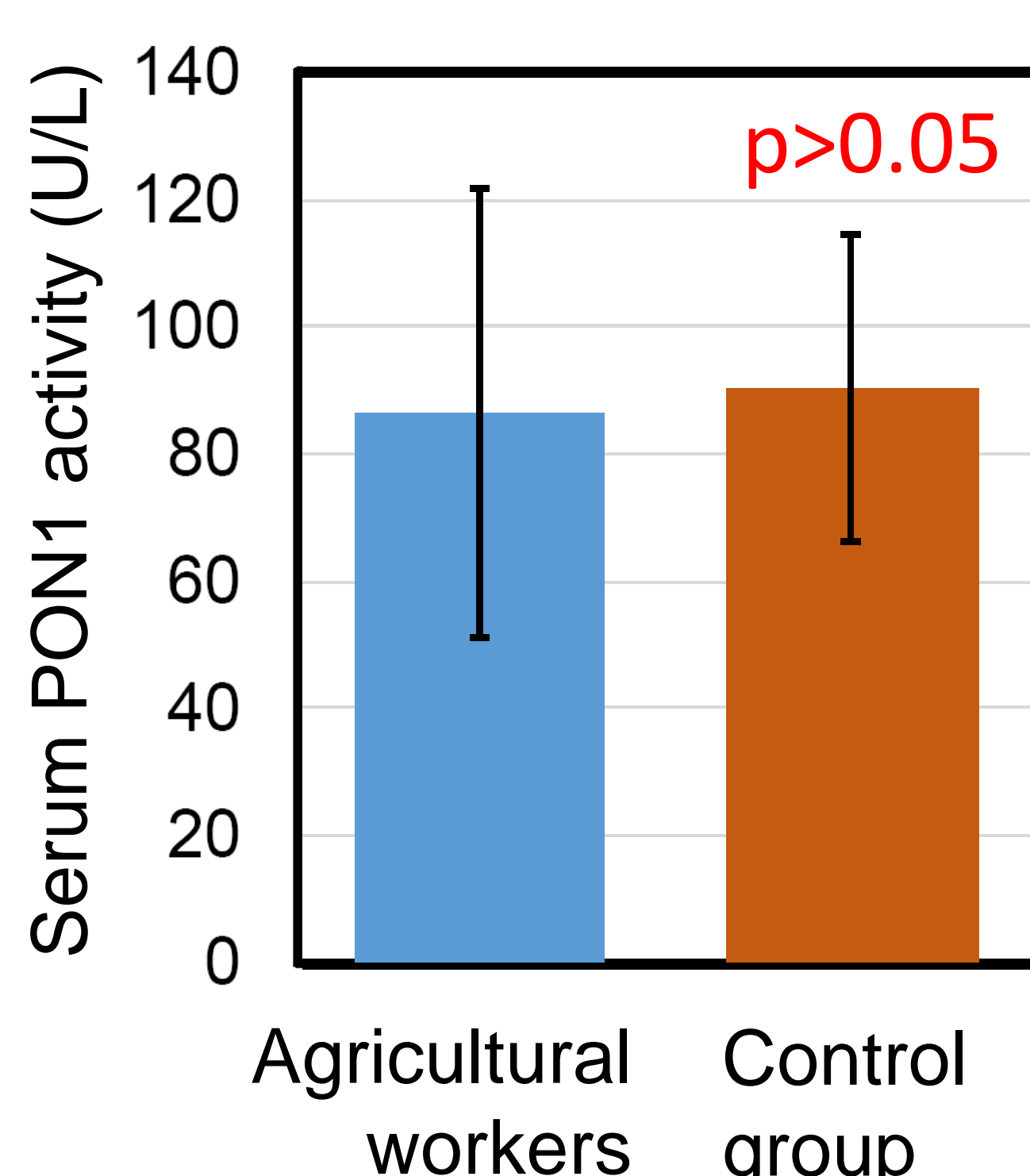


Fig.(2) Comparison of serum PON1 activity between agricultural workers and control group

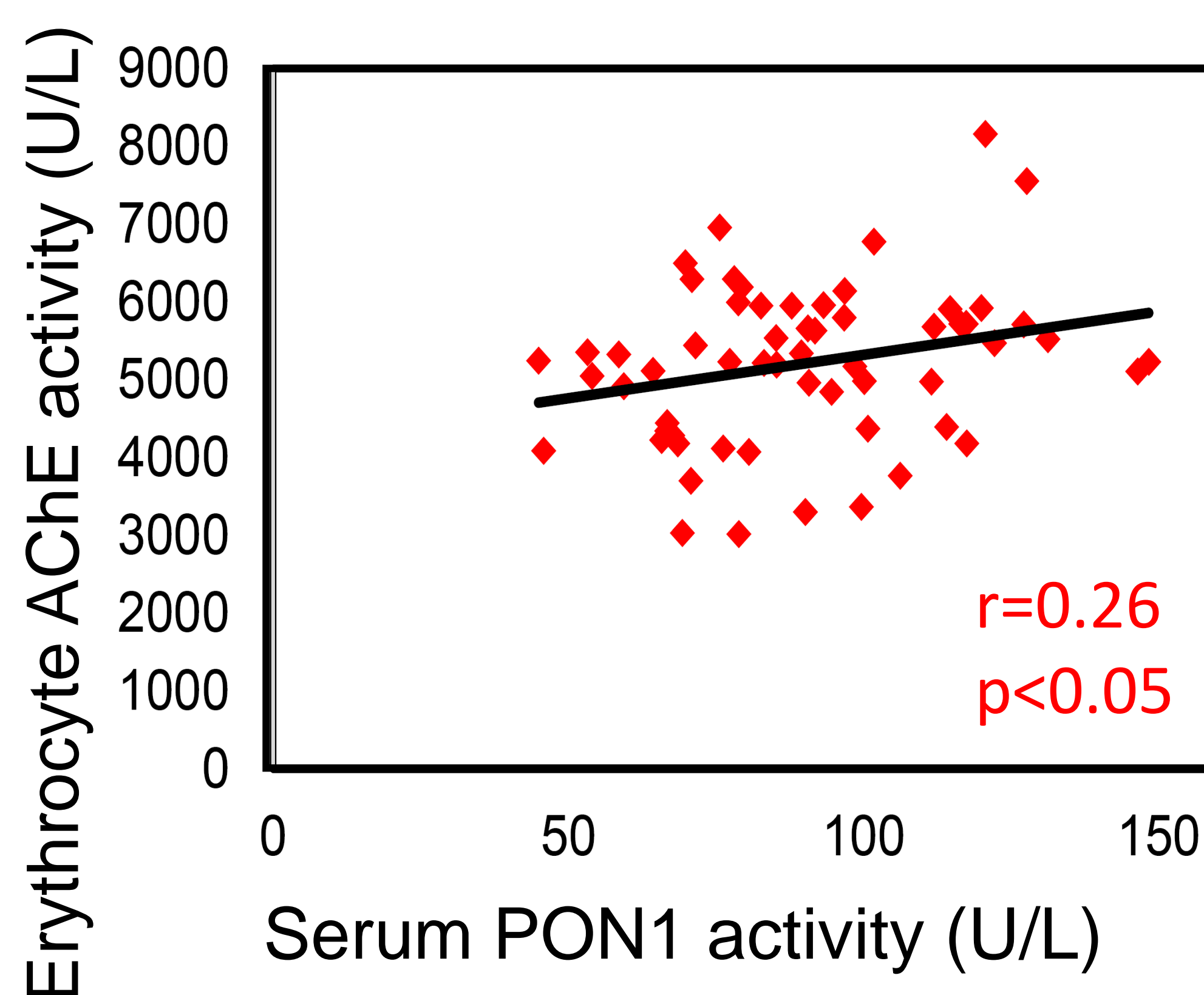
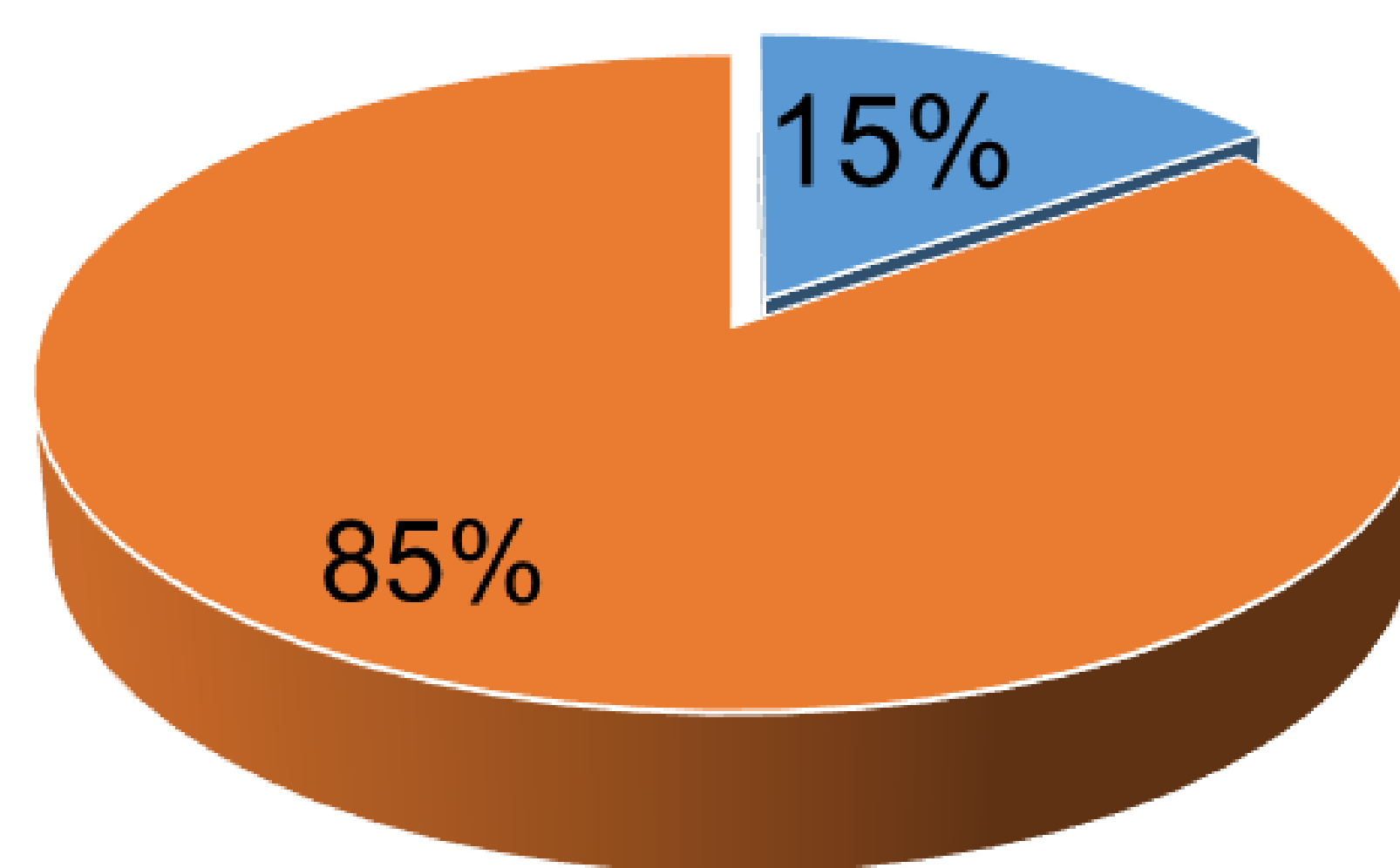


Fig.(3) Correlation between serum PON1 activity and erythrocyte AChE activity in agricultural workers

### Pesticides used by agricultural workers

- Acephate<sup>1</sup>
  - Acetamiprid<sup>3</sup>
  - Chlorpyrifos<sup>1</sup>
  - Cypermethrin<sup>2</sup>
  - Dimethoate<sup>1</sup>
  - Imidacloprid<sup>3</sup>
  - $\lambda$ -Cyhalothrin<sup>2</sup>
  - Phenthoate<sup>1</sup>
  - Profenofos<sup>1</sup>
- 1= OP  
2= Pyrethroid  
3= Neonicotinoid



- Workers who used partial PPE
- Workers who used no PPE

Fig.(4) Utilization of personal protective equipment (PPE) among the agricultural workers



Fig (5) A pesticide sprayer working with no PPE in the farm

## Discussion

- Agricultural workers used different types of pesticides and OPs is the major type.
- Decreased AChE activity in agricultural workers indicates that they have subclinical OP toxicity.
- Weak correlation indicates that detoxification of OPs by PON1 can give only moderate degree of protection.

## Conclusion

- Exposure to pesticides gives adverse effect to agricultural workers.
- Awareness to use PPE is low among agricultural workers.
- Detoxification mechanism may not give effective protection against work-related pesticide toxicity.
- Safety measures should be taken systematically during application of pesticides.