

**IMPACTS OF PESTICIDES EXPOSURE ON  
SEMEN CHARACTERISTICS AMONG MALE FARMERS  
IN KIENXUONG DISTRICT, THAIBINH PROVINCE, VIETNAM**

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AMONG MALE FARMERS IN KIENXUONG DISTRICT, THAIBINH  
PROVINCE, VIETNAM

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ABSTRACT

This case-control study assessed the impacts of pesticide exposure on the semen characteristics of rice farmers in Kienxuong District, Thaibinh Province, Vietnam. The study objectives were to describe the characteristics of the sperm specimens and to explore the association between pesticide exposure and the sperm quality of the rice farmers.

Semen samples of 1,036 rice farmers were obtained by manual masturbation and screened at Commune Health Stations. Of these, 156 abnormal samples were identified; 314 rice farmers with normal semen were recruited as controls. All of the semen characteristics of the cases were significantly poorer than the controls. In the abnormal group, volume (1.06 ml), concentration ( $11.21 \times 10^6$  per ml), total sperm count ( $11.92 \times 10^6$  sperms), rapid progression (14.46%), rapid and slow progression (30.94%) and vitality (44.34%) (except percentage of normal morphology) were all below the normal parameters of the World Health Organization criteria.

Risk factors for abnormal semen were: distance less than 300 meters from household to rice field (crude OR = 3.08, 95% CI: 2.03 - 4.66), duration of work as a rice farmer greater than 10 years (crude OR = 3.61, 95% CI: 2.18 - 5.99), no pesticide training (crude OR = 2.49, 95% CI: 1.58 - 3.92), non-use of personal protective equipment (PPE) when mixing pesticide (crude OR = 1.55, 95% CI: 1.05 - 2.30), and non-use of PPE when spraying pesticide (crude OR = 3.02, 95% CI: 2.01 - 4.54). Factors associated with abnormal semen after adjusting for age, smoking, and alcohol drinking by logistic regression were: distance less than 300 meters from household to rice field and duration of work as a farmer over 10 years (adjusted OR = 3.16, 95% CI: 1.97 - 5.05 and adjusted OR = 3.98, 95% CI: 2.20 - 7.21, respectively). Rice farmers without PPE when spraying pesticides and without pesticide training (adjusted OR = 3.05, 95% CI: 1.92 - 4.85 and adjusted OR = 1.90, 95% CI: 1.14 - 3.16, respectively) were also at risk of abnormal semen when compared to the controls. These findings showed the strength of association between pesticide use and abnormal semen characteristics among rice farmers in Kienxuong District, Thaibinh Province, Vietnam.

KEY WORDS: PESTICIDE EXPOSURE/ SEMEN CHARACTERISTICS/  
MALE INFERTILITY/ RICE FARMERS/ VIETNAM

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