Health risk exposure to cypermethrin: A case study of kano state, Nigeria

RAIMI Morufu Olalekan[1,2], SAWYERR Henry Olawale[2] and **ISAH Hussain Muhammad[2,3]**

[1]Faculty of Clinical Sciences, Niger Delta University, Nigeria
[2]Department of Environmental Health Science, Kwara State University, Nigeria
[3]Kano State College of Health Sciences and Technology, Nigeria

Introduction

There is no denying the fact that the current poor pesticides safety performance in Nigeria is as a result of the defective issues surrounding it. One of the most common causes of death from pesticides is carelessness in the application. Spray applicators frequently ignore recommended procedures and cover themselves with the pesticides they are using. Most of the exposure is dermal. Pray droplets are too large to be easily inhaled. Protective clothing is uncomfortable to wear, especially in warm weather, when most applications take place. As Pesticides become an important and growing component of the 21st century that has been widely adopted globally to control pests, diseases, weeds and other plant pathogens, in an effort to reduce or eliminate losses in yield and maintain good product quality. As the world relies heavily on pyrethroids for the control of vector-borne diseases, including malaria. Huge advances have been made overthepast20yearsinmalaria control to cut transmission by about half, primarily using pyrethroid-treated mosquito nets, and prevented millions of malaria-caused deaths in the process (Bhatt et al., 2015).Although pesticides are said to be toxic and exposes farmers to risk due to the hazardous effects of these chemicals, the use of these chemicals causes headaches, nausea, tremors, and damage to important organs such as the liver and kidneys. Accumulation of insecticides little by little in a long time can cause delayed effects which are more dangerous than diseases caused by receiving insecticides once in rather high levels. Delayed effects occur in the form of skin cancer, lung cancer and liver cancer (Wardhana, 2004).Pesticide useamong farmers in Kano is relatively high and farmers in Kano practice both subsistence and commercial farming, which use large amounts of pesticides. Studies by Isah, (2019) and Isah et al (2020 in print) shows the most commonly used pesticide Cypernethrim 118 (33.6%)was applied often by farmers in Kano State (see figure 1 below) and are those categorized by the WHO, 2009 asmoderately hazardous and slightly hazardous, mostly pyrethroids, phenylamide and s-metolachlor compounds. Given series of evidence of unsafe handling practices in Kano State (Isah, 2019), and the huge quantity of pesticides distributed suggests a high potential for human exposure, health injuries and illness. Indeed, study identified acute pesticide poisoning (APP) as a major problem in the farming community (Isah, 2019).At global level, it is estimated that hundreds of thousands of people die yearly from the consequences of pesticides exposure (Konradsen et al., 2003; Sekiyama et al., 2007) but the most problematic poisoning circumstance is suicide. Despite the high burden of APP in developing countries, there is sub stantialunder-reporting suggesting that the burden of disease due to APP is frequently underestimated (London & Bailie, 2001). In addition, the World Health Organization (WHO) estimates that 1 - 5 million cases of pesticide poisoning occur in farmers with a death rate reaching 220,000 people yearly. Direct (acute) poisoning can reduce cholinesterase activity. Cholinesterase is an enzyme (a form of biological catalyst) in body tissues that acts to keep muscles, glands and nerve cells working in an organized and harmonious manner. Decreased cholinesterase activity will affect the muscle fibers consciously with smooth and rough movements as a result, farmer's experience headache, stomach cramps, muscle weakness, vomiting, dizziness, shortness of breath, blurred vision, eye irritation (Gallo, 1991; Isah, 2019).

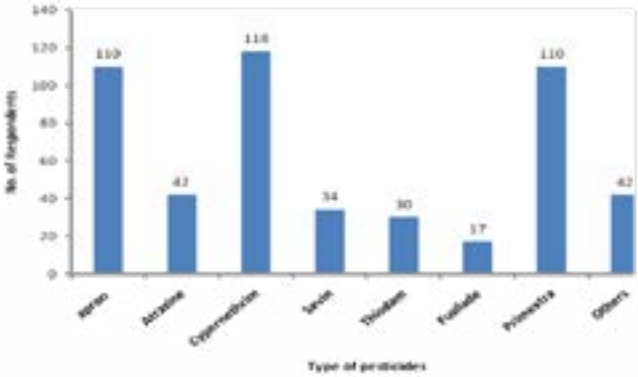

Figure 1: Chart showing the different types of pesticides used by farmers in Kura LGA of Kano State. (Adapted from Isah, 2019)

Semantically, cypermethrin is known to be a synthetic pyrethroid that is used in large-scale as agricultural insecticide. It degrades easily in soil and plants. Pyrethroid pesticides have short life span and relative low toxicity. They have a quick degradability of compounds and a low risk on the environment (Niu and Yu, 2009). However, the misuse, abuse, or overuse of these pesticides can make them stored in soil and make them toxic to soil born organisms, even at low levels. Pyrethroid are group of pesticides possibly causes convulsion, diarrhea, headache, vomiting, excessive nasal mucous discharge, sweating, sudden swelling of face, eye lids, lips, mouth and throat tissues, hey-fever like symptoms and decrease hormone release from brain (Sharley, 2002).Most of these products are used on export crops (Galt, 2008).This trend is mirrored by similar shifts in the pattern of agents most commonly reported as causing poisoning. For perspective, a higher single trace concentration of this metabolite in urine was associated with an increase in cardiovascular death in 18 of 41people over the next 14 years, and an additional 90 of 246 people were at increased risk of all-cause mortality (Bao et al., 2020). Pyrethroids act by binding to sodium channels in the nerves of insects, resulting in paralysis and death (Soderlund, 2012), and they produce transient neuro toxic effects in mammals at high doses. Although, studies have shown that there is no purported mode of action for pyrethroids to cause myocardial in fraction or stroke. As all pesticides undergo extensive safety

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