Plenary - 02

Cognitive toxicity of pesticide poisoning and drug overdose: Challenges for the transforming South Asia

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Pesticide poisoning is a major clinical and public health problem in agricultural communities of South Asia. Organophosphates are the most commonly used pesticides in the region. Organophosphates act as cholinesterase inhibitors thus bring about acute neurological deficits in humans through widespread cholinergic overactivity. Our research in Sri Lanka over last ten years focuses on long-term neurocognitive deficits of organophosphates, a less known yet important entity. We employ neurophysiological (viz. cognitive event-related potentials) and neuropsychological techniques to assess the cognitive effects of these chemicals. The findings hitherto indicate both acute large-dose poisoning and subclinical occupational exposure are associated with long-term neurophysiological and neuropsychological impairment. Further, our ongoing research indicates that hypoxia during the acute phase of poisoning increases the risk of long-term cognitive impairment. The impact of this impairment in day-to-day functioning of the victims is yet to be determined.

In the same way that the pesticide use and misuse are common in agricultural communities, use and misuse of sedative psychotropic medications are common in urbanised societies. Sedative drugs, even in therapeutic doses seem to be associated with impaired driving and underlying cognitive functions, and increased traffic crash rates. We also found that, when taken in overdose, these drugs have cognitively impairing effects that go beyond clinical recovery from acute poisoning. Furthermore, these patients are more prone to traffic crashes at least up to 4-weeks following exposure, and the cognitive recovery over this period mirrors the crash risk at different post-exposure time points.

As many regions of South Asia transform from traditional agricultural communities to urban industrialised societies, the pattern of poisoning changes from agrochemicals into pharmaceuticals, particularly psychotropic drugs. The two lines of research reported above highlight how the changing social fabric in the region poses new challenges for the researchers and clinicians of the region.