

The relationship between exposure to organophosphate pesticides and changes in glucose homeostasis

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Abstract: Organophosphorus (OP) compounds are cholinesterase-inhibiting chemicals used as pesticides. Exposures to OPs cause a significant number of poisonings and deaths each year. One of the reported adverse effects in human exposure to OPs is hyperglycaemia. Animal studies have also shown altered glucose homeostasis following acute or chronic exposures to OPs. Several mechanisms are thought to be involved in OP- induced changes in glucose homeostasis in both acute and chronic exposures. OPs can influence body glucose homeostasis by several mechanisms including physiological stress, oxidative stress, inhibition of paraoxonase, nitrosative stress, pancreatitis, inhibition of cholinesterase, stimulation of adrenal gland, and disturbance in metabolism of liver tryptophan. Multicentre clinical trials should be carried out to determine if any relationship between concentration of blood OP and hyperglycemia exists. Diabetics are the first people that could be involved in these types of studies. After performing adequate clinical studies, a cautious meta-analysis will clarify any relationships. In addition, epidemiological studies should be focused on those who are occupationally exposed to OP pesticides especially pesticide formulating employees or farmers who use OP pesticides. Studies should be focused on incidence of diabetes among those people.