

to different pesticides [4,5]. The induction or inhibition of certain enzymes by pesticides results in altering the biochemical status in an individual. Inhibition of cholinesterase alters liver and kidney functions, decrease hemoglobin [Hb], impair oxidative stress and cause antioxidants imbalance. In pesticide-exposed workers, the adverse effects on drug metabolising enzymes in the liver have been reported [4,6]. Therefore, the present study is aimed at assessing the influence of pesticides exposure and their toxicity on hematologic parameters and on liver and kidney function tests in occupationally exposed pesticides sprayers of mango plantation in Malihabad, Lucknow [India].

A UHF]UgUbXA Yh,cXg

A UHF]Ug

This study group included 60 subjects who were occupational pesticide sprayers of mango plantation and 30 normal healthy individuals as control subjects who were not exposed to pesticides. The subjects were taken from Malihabad area of Lucknow, UP, India whose age ranges from 20 to 45 years. The control subjects were of similar age groups and were field workers from the same area. They neither performed any spraying activities nor have any kind of pesticide exposure. The pesticide sprayers were updated with the information about the aim of study and health hazards of exposure to pesticides and written consent was taken before collecting relevant data and biological material. A set of questionnaires and interview were used to collect demographic, occupational and clinical data.

All the subjects involved in the study belonged to agricultural families with almost similar socio-economic status. The subjects lacked any past history of major illness. The food habits including dietary intake of all subjects were comparable as observed from periodical checkups of their lunch boxes. Besides, their routine breakfast and dinner were also verified. Of the study group subjects the educational status was: primary schooling [40%], passed high school [50%] and

A Yij fYa YbhcZgfi a WUj|b|yZUbXWc`Yhmc`

Serum creatinine was estimated by Jafes method [17]. Serum creatinine in alkaline medium reacts with picrate to produce an orange colour that absorbs light at 492 nm. The rate of increase in absorbance is directly proportional to the concentration of creatinine in specimen. Blood glucose was measured by employing enzymatic method [18].

Serum cholesterol was measured [19]. In the former, glucose oxidase converts glucose to gluconic acid, yielding hydrogen peroxide [H_2O_2]. Cholesterol esterase hydrolyses cholesterol esters into free cholesterol and fatty acids, and cholesterol oxidase then converts the cholesterol to H_2O_2 and cholest-4-en-3-one. H_2O_2 in the presence of peroxidase oxidatively couples with 4-aminoantipyrine and phenol to produce a red quinoneimine dye, having an absorbance maximum at 510 nm. The

| <Y a Uhc`c []W DUfU a YhYfg | GhiXm ; fci d B=[60] | Ccbhfc` ; fci d B=[30] |
|---------------------------------|---------------------------------|-------------------------------|
| Hemoglobin Hb [gm/dL] | 13.83 ± 1.47* [9.6-174] | 14.86 ± 080 [1290-1620] |
| Hematocrit [HCT%] | 44.02 ± 2.97* [3290-51.70] | 45.37 ± 2.50 [39.80-5020] |
| MCV [fl] | 85.55 ± 4.55* [66.30-96] | 88.95 ± 4.08 [76.90-96.40] |
| MCH [pg] | 28.70 ± 2.73** [19.40-33.70] | 30.06 ± 1.61 [25-33.90] |
| MCHC [gm/dL] | 31.80 ± 2.13** [23.90-35.90] | 33.75 ± 1.83 [28.50-36] |
| RBC count [Million/μL] | 5.04 ± 0.42*** [413-5.87] | 5.46 ± 0.64 [390-65] |
| WBC count [mm ³] | 7.74 ± 1.58** [5-12.20] | 6.55 ± 1.18 [4.50-10] |

physical exercise has favorable effects on serum lipids and lipoproteins level especially in reducing total cholesterol [52]. The finding of increased serum creatinine and blood urea levels in these pesticide sprayers of mango plantations agrees with the results of prior studies reporting subtle nephro-toxic changes in workers occupationally exposed to pesticides [53]. Acute renal insufficiency has been reported in malathion-exposed sprayers [54]. Rhabdomyolysis, a well-known complication of severe poisonings, appears to be relatively frequent in severe OP pesticide intoxication, including diazinon. If not treated correctly, it may lead to acute renal failure and paresis in later stages [55]. Due to the contraction of the smooth muscle of the bladder symptoms may include strangury and frequent involuntary urination. When exposed to a mixture of pesticides [monocrotophos, hexachlorocyclohexane, and endosulfan] at varying intervals, histopathologic changes were observed in the liver, kidney, and muscles of normal, protein-malnourished, diabetic as well as both protein-malnourished and diabetic albino rats. The examination in the pesticides-exposed rats revealed hepatotoxic, nephrotoxic, and muscular necrotic effects. In case of protein-malnourished and diabetic animals or in animals with both these disorders the toxicity was aggravated and severe [55,56].

Therefore, based on past reports, the present study indicates that the slight nephro-toxicity in pesticide sprayers of Malihabad, mango plantation is due to the use of various pesticides used. Compared with the control group, all hematologic parameters studied here in pesticide sprayers [study group] decreased, except for the WBC, which increased. Several studies have reported decreased Hb levels in humans exposed to OP pesticides [60-61]. Due to the disruptive effect of the pesticides on the bone marrow, which produces red and white blood cells there was a decreased Hb and RBC. The hematology assay

