Chlorine-induced damage documented by neurophysiological, neuropsychological, and pulmonary testing.

Kilburn KH.

Source

University of Southern California, School of Medicine, Environmental Sciences Laboratory, Los Angeles 90033, USA.

Abstract

Chlorine causes acute pulmonary edema and damages airways, thus producing obliterative bronchiolitis. In the case series in this study, its adverse effects were extended to visual and central nervous system impairment. Twenty-two patients exposed briefly to undiluted chlorine at home or work were evaluated with a battery of neurobehavioral and visual tests. Their test scores, expressed as percentage predicted, were compared with those of unexposed subjects. Chlorine-exposed subjects had impaired balance (with eyes open and eyes closed), delayed simple and choice reaction times, impaired color discrimination, impaired visual field performance, decreased hearing, and decreased grip strength. Blink reflex latency was delayed on the right. Cognitive performance (i.e., digit symbol and vocabulary), peg placement, trail making A and B, and verbal recall were significantly below predicted levels. Well-learned memory functions were not impaired. Adverse mood states scores were elevated as were the frequencies of 28 of 35 common symptoms. Forced vital capacities were reduced. The duration of chlorine exposures was from a breath or two to several hours, and exposures were associated with impaired neurophysiologic and neuropsychologic functions. Impairments appeared insidiously, were noted 1 to 48 mo after exposure, and persisted. Such functional losses must be prevented. Additional chlorine-exposed patients should be evaluated for neurological and pulmonary damage.