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RELATIONSHIP BETWEEN DRINKING WATER WITH BLOOD ARSENIC LEVEL AND SKIN LESIONS OCCURRENCE IN BUYAT VILLAGE NORTH SULAWESI INDONESIA

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Abstrak

Kontaminasi Arsenik pada air tanah merupakan krisis kesehatan masyarakat di daerah Buyat, dimana penduduk yang terkontaminasi arsenik melalui air minum dari sumur gali yang digunakan untuk minum dapat menimbulkan berbagai lesi kulit. Studi kasus control dimaksudkan untuk meneliti faktor risiko air minum dengan konsentrasi arsenik dalam darah dan lesi kulit. Jumlah sampel sebanyak 54 kasus yang menderita lesi kulit dan sebanyak 54 kontrol dengan tidak ada lesi kulit. Kemudian dilakukan analisis risiko dengan menggunakan Odd Rasio (OR). Hasil menunjukkan bahwa konsentrasi arsenik dalam air minum pada sumur gali sekitar 0,01-0,104 mg/L (rata-rata 0,056 mg/L). Analisis risiko antara konsentrasi arsenik dalam air minum dengan konsentrasi arsenic dalam darah didapatkan nilai OR = 19,45 95% CI: 6,52-58,00), kemudian kadar arsenik dalam darah dengan kejadian lesi kulit (keratosis dan hiperkeratosis) didapatkan nilai OR = 15,63, CI 95%: 4,94-49,40). Penelitian Ini menyimpulkan bahwa tingginya kadar arsenik dalam air minum dan darah merupakan faktor risiko terjadinya lesi kulit pada penduduk di daerah Buyat Sulawesi Utara Indonesia.

Kata kunci: arsenik, air minum, darah, kelainan kulit.

1. Introduction

Arsenic is an ubiquitous element with metalloid properties. Its chemistry is complex and there are many different compounds of both organic and inorganic arsenic. In nature, it is widely distributed in rocks, soil and sediments. In water, arsenic occurs in both inorganic and organic forms. The main organic arsenics, methylarsenic acid and dimethylarsenic (WHO, 2003a; 2003b; ATSDR, 2005; 2007; 2007b) in air, particulate matters have been shown to contain both inorganic and organic arsenic compounds. Plants grown on soil, marine algae and seaweed usually also contain considerable amount of arsenic. In industries arsenic compounds are mainly used in agriculture and forestry. Much smaller amount is used in the glass and chemical industries as feet, additive and drugs. Arsenic can be a source of environmental pollution, near sites of coal burning and smelting of metals (Daud, 2009). A study was

previously reported the association of levels of arsenic in drinking water and blood with the prevalence of keratoses and hyperpigmentation in West Bengal. Another study also identified cases who apparently consumed low levels of arsenic (10 µg/liter). However, the survey examined only the participants' primary current drinking-water source. Here, we present a nested case-control study to examine the dose-response pattern for the arsenic-induced skin lesions using detailed exposure assessment. The exposure assessment incorporates arsenic concentration data from current and past water sources used in households and work sites (Haque, 2003, Daud, 2009).

Chronic ingestion of inorganic arsenic causes characteristic skin lesions including pigmentation changes, mainly on the trunk and extremities, and keratoses of the palms of the hands and soles of the feet. Hyperpigmentation has been described as