

Simultaneous presentation of squamous cell carcinoma and basal cell carcinoma in a patient of chronic arsenic poisoning: a case report

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Abstract

“Arsenicosis” is a known health hazard in certain areas of our country, contaminated drinking water being the chief source of intoxication. Common manifestations include typical pigmentation, keratosis with or without involvement of internal organs. The worst consequence is development of malignancies, typically squamous cell carcinoma and basal cell carcinoma among others. We report a case of a 50-year-old farmer from N-24 Paraganas (West Bengal, India) found to consume water with more than permissible arsenic level for almost 10 years, presenting with aforesaid cutaneous malignancies simultaneously. Chronic arsenic exposure is known to cause cutaneous malignancies in people. However, a simultaneous occurrence of both squamous and basal cell carcinomas in the same subject is rarely seen.

KEY WORDS: Arsenicosis, cutaneous malignancies, squamous cell carcinoma, basal cell carcinoma

Introduction

Arsenic is a ubiquitous element present in the earth's crust, transported in the environment mainly by water. Arsenic exposure occurs primarily by the ingestion of contaminated drinking water.^[1] The arsenic-induced skin changes are one of the most common manifestations, the typical presentation being an insidious onset of abdominal pain, diarrhea, sore throat with symmetrical rain drop pigmentation on the trunk, palmer, and solar keratosis.^[2] The cutaneous malignancies most commonly seen are squamous cell carcinoma, basal cell carcinoma, Bowen's disease, or squamous cell carcinoma in situ.^[3]

We hereby report a clinically and laboratory confirmed case of chronic arsenic poisoning who had an uncommon presentation of squamous cell carcinoma of varying degrees of differentiation and basal cell carcinoma simultaneously along

with other skin manifestations such as hyperpigmentation and keratosis.

Case Report

A 50-year-old man, farmer by profession, and a permanent resident of N-24 Paraganas, West Bengal, India, presented in the medicine outpatient department (OPD) with complaints of generalized weakness, mild abdominal pain, and episodes of diarrhea and weight loss. On examination, there were multiple lesions all over his skin, predominantly on his trunk and extremities. The patient was mildly anemic, liver function tests were within normal limits. No other significant abnormality was noted on initial examination. The patient was referred to the dermatology OPD for his skin lesions. The patient had multiple hyperkeratotic patches over his body, raindrop hyperpigmentation, and lesions in sun-protected areas, which were clinically suspected to be cutaneous carcinomas. The presentation of the patient prompted the clinician to consider arsenic poisoning; and hence, the drinking water sample and the nail sample of the patient were tested for arsenic concentration. It was found to be more than the permissible limit.^[4]

Biopsies were taken from the lesion on scalp, left hand [Figure 1], right shoulder [Figure 2], and abdominal wall, and they were sent for histopathological examination.

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The biopsies were grossed and processed in our department and on histological examination, sections from the scalp lesion showed features of well differentiated squamous cell carcinoma, and the abdominal wall lesion was found to be a moderately differentiated squamous cell carcinoma [Figures 3 and 4]. The left hand lesion showed hyperkeratosis, acanthosis, and increased melanocytes in the basal layer [Figure 5]. However, the sections from the lesion on the right shoulder showed histological features of a superficial basal cell carcinoma [Figures 6 and 7].

Discussion

Arsenic is one of the most toxic elements present in the environment and the major cause of human arsenic toxicity is contamination of drinking water from natural geological sources.^[1] Arsenic absorption occurs in small intestine, is

metabolized in liver, and 50% of ingested dose is excreted through urine.^[5,6] In chronic arsenic ingestion, it predominantly accumulates in liver, kidneys, heart, and lungs, and ultimately gets cleared from these sites, the residual amounts are left in the keratin-rich tissues such as nails, hair, and skin.^[7]

“Arsenicosis” is defined as a chronic health condition arising from prolonged ingestion of arsenic above the safe dose for at least 6 months, is usually manifested by characteristic skin



Figure 1: Lesions on the hands.



Figure 2: Rain drop pigmentation on the back of the subject.

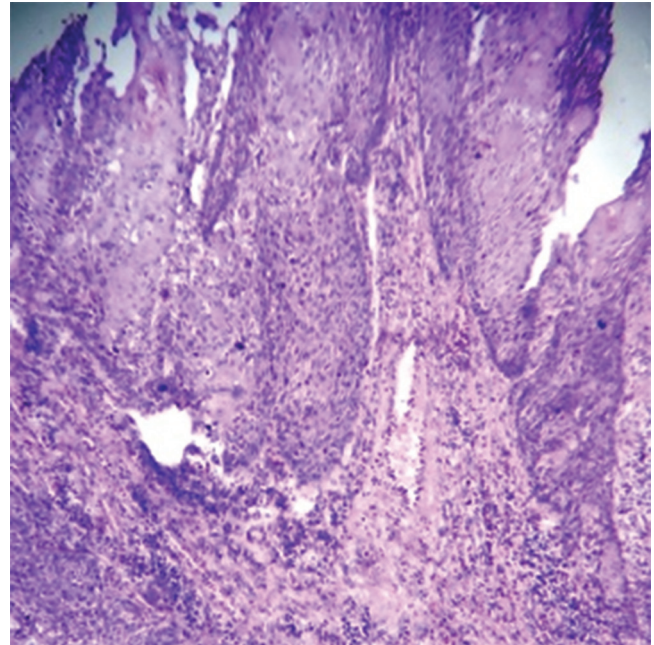


Figure 3: Microscopic view showing features of squamous cell carcinoma.

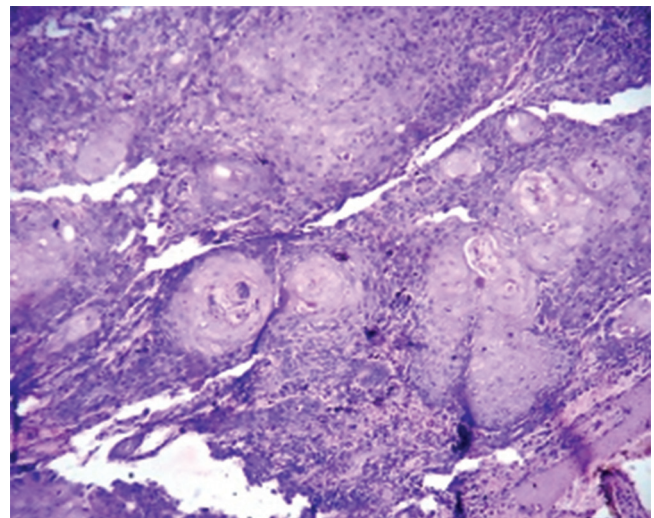


Figure 4: Microscopic view showing features of squamous cell carcinoma.

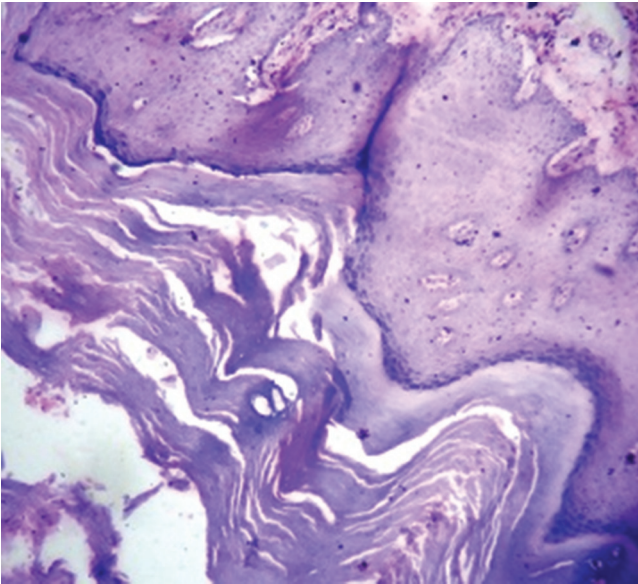


Figure 5: Epidermis showing hyperkeratosis and acanthosis.

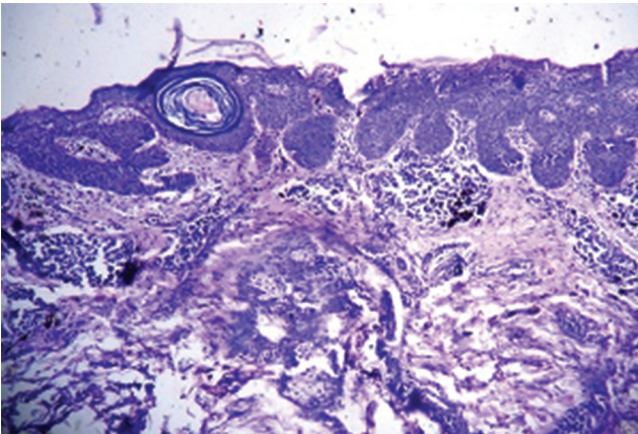


Figure 6: Microscopic view showing features of basal cell carcinoma.

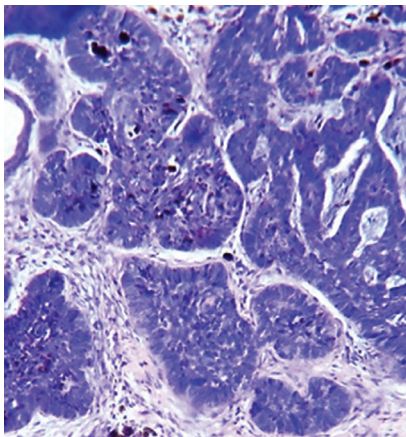


Figure 7: Microscopic view showing features of basal cell carcinoma.

lesions of melanosis and keratosis, occurring alone or in combination, with or without the involvement of internal organs.^[8,9]

According to the field guide, a “clinically confirmed case of arsenicosis” is a probable case with pigmentation and/or keratosis in whom the presence of other arsenicosis-simulating skin lesions has been ruled out by differential in-depth skin examination by either a trained dermatologist or an arsenic expert.^[8]

A “clinically and laboratory confirmed case” is a “clinically confirmed case” in whom the arsenic test is also positive by the recommended laboratory criteria.

The lab criteria are as follows:

1. Consumption of drinking water with an arsenic concentration in excess of prevailing standards for at least 6 months. (According to the World Health Organization and Bureau of Indian Standard, the level is 0.01mg/L).^[4]
2. An elevated concentration of arsenic in hair (>1 mg/kg) or nails (>1.5 mg/kg).^[8]

The two worst affected areas in the world are Bangladesh and West Bengal, India. In West Bengal, it has been reported that the arsenic concentration in some tube wells is as high as 3.400 mg/L.^[10]

Long-term exposure to arsenic leads to the development of multisystem disease and the most serious consequence is malignancy. The clinical manifestations have been found to be highly variable among individuals, population groups, and geographical areas. It is still unclear what causes a particular organ to be targeted and a particular manifestation to occur.

Arsenic causes a multisystem involvement of the body including cancers of skin, liver, and according to a recent Taiwanese epidemiological study, even cancers of lung, bladder, and kidney have been noted as a result of arsenic exposure.^[12]

Among the skin cancers, basal cell carcinoma and squamous cell carcinoma have been reported as the most common malignancies, the fact that their occurrence in sun-protected areas of the body is highly supportive of the same as usually cutaneous carcinomas occur in sun-exposed areas of the body.

We have reported here a case of simultaneous presentation of squamous cell carcinoma and basal cell carcinoma in a clinically and laboratory confirmed case of arsenicosis. Our patient is a permanent resident of West Bengal and has been drinking the same water for almost last 10 years, which was found to be contaminated with high levels of arsenic. His family consists of his wife and four grown-up children, two daughters, who have been married off, and two sons, who were reported to be healthy apparently.

Conclusion

Chronic arsenic exposure is known to cause cutaneous malignancies in people. However, a simultaneous occurrence of both squamous and basal cell carcinoma in the same subject is seen rarely.

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