Papers

Detection of Arsenic in five cases of erythroderma

M H A J P Chandani[1] and **D N Athukorale**[2]

Sri Lanka Journal of Dermatology, 1998, **3**, 12-15

Summary

Erythroderma can be provoked by heavy metals including arsenic. We report five patients with erythroderma in whom hair and nail Samples contained arsenic. All of them gave a history of ingestion of an Ayurvedic medication 2 - 8 weeks prior to the onset of the erythroderma. In two of these patients arsenic was also detected in the Ayurvedic medication.

Introduction

Erythroderma has a chronic course and a multiplicity of causes[1-7]. Many series, including two from Sri Lanka[8,9], points to a large group of patients in whom no cause could be found[1,7].

Among the rarer causes of erythroderma heavy metals, including Arsenic, have been implicated[2,3,7,10-13]. Many of our patients had taken some form of native (Ayurvedic) medication prior to detection of the erythroderma. The posibility of arsenic being in these medication lead us to examine the hair and nails of these patients.

Case 1

A 40 year old labourer presented with erythroderma of 3 months duration. He had eczema over the palms and soles since childhood with relapses and remissions. For the last relapse he had taken Ayurvedic treatment for six weeks and started developing generalised erythema and scaling with intense prunitus. There was neither the evidence of chronic arsenic poisoning such as hyperkeratoses of palms and soles, rain drop pigmentation or Aldrich's mees lines nor of malignancy. All the basic investigations (ESR, full blood count, fasting blood sugar, renal and liver profile, chest X ray, ultra sound scan of the abdomen and serum protein electrophoresis) were within normal limits. Skin biopsy showed evidence of chronic dermatitis.

The qualitative estimation of arsenic in hair and nails gave positive results. The analysis of the medication in liquid form (*arishta*) also gave the positive results for arsenic.

Case 2

A 42 year old farmer presented with erythroderma of four months duation. He had recurrent episodes of eczema over the legs in the past. Six weeks prior to the onset of erythrodema he had taken Ayurvedic treatment for the eczema. He was hyperpigmented and had generalised scaling. He had hyperkeratoses of palms and soles with rain drop pigmentation. There was no lymphadenopathy or hepatospleenomegaly. All his basic investigations were within normal limits. Skin biopsy showed evidence of chronic dermatitis. Arsenic was detected in his hair and nails as well as in the medication in liquid form (*arishta*).

He had more severe form of erythroderma with frequent relapses.

Case 3

A 59 year old farmer presented with erythroderma of three months duration. He had taken Ayurvedic treatment for insomnia, one month prior to the onset of erythrodema. He denied a history of skin diseases in the past. He had hyperpigmeted scaly rash all over the body. There was no other evidence of chronic arsenic poisoning, lymphadenopathy or hepatospleenomegaly. All the basic investigations were within normal limits.

[1]*Senior Registrar*, [2]*Consultant Dermatologist, The National Hospital of Sri Lanka.*

Skin biopsy showed evidence of chronic dermatitis.

The hair and nail arsenic analysis gave positive results.

We could not obtain the medication for analysis in this case.

Case 4

A 42 year labourer presented with erythroderma of three months duration. He had chronic dermatitis over the palms and soles in the past. One month after taking Ayurvedic treatment for the last relapse, he developed generalised scaling and erythema with pruritus. There was no other evidence of chronic arsenic poisoning or malignancy. Skin biopsy showed evidence of sub acute dermatitis.

The qualitative extimation of hair and nails gave positive results but medication could not be obtained for analysis.

Case 5

A 60 year old male driver presented with erythroderma of six months duration. He had eczema over the both legs for several years with remissions and relapses. For the last relapse he had taken Ayurvedic medication for two months before developing generalised itching and scaling with erythema all over the body. He was hyperpigmented and had generalised scaling. There was no hepatospleenomegaly or lymphadenopathy. The basic laboratory investigations were within normal limits. Skin biopsy showed evidence of chronic dermatitis.

He was treated with a ten day course of Dimercaprol. During that period his symptoms were much less. He was completely symptom free after the course. But later he presented with a partial relapse.

We also had a 16 year old school girl with erythroderma, who gave a history of taking Ayurvedic medication two weeks prior to the onset of erythroderma. Her hair and nail analysis for arsenic gave negative results, but the medication, she took prior to the onset of erythroderma in '*guli* and *arishta*' form gave strongly positive results.

Discussion

Many studies have been done to determine the cause of erythroderma[1-7,14,15]. In all the studies there was a large group (ranging from 12-46%) where no definite cause could be detected and was labelled - idiopathic. In the Sri Lankan stud-ies[8,9] a large number of patients had chronic persistant erythroderma. Many of these patients had at some time taken Ayurvedic medication for the disease and many of them reported exercebation with the medication.

We report five such patients who had taken local medication in the form of '*arishta* and *guli* (mixtures and pills) 1 - 2 months prior to the onset of erythroderma. In all of them we detected arsenic in the hair and nails. Two of these patients arsenic was also found in the medication. In one other patient with erythroderma, who had an Ayurvedic medication in the previous two weeks, there was no arsenic found in the hair and nails but the medication (in *guli* form) did contain arsenic.

Heavy metals have been implicated as a cause of erythroderma[2,3,7,10-13]. Gold was a cause of erythroderma in a one case from a series of 102 patients[7].

Chronic arsenic poisoning occurs in low dose exposure in industry or consumption of contaminated food, water, medication[13]. In Sri Lanka opium contained arsenic have been detected as a cause for chronic arsenic poisoning[16,17]. Opium and its derivatives are used in preparation of Ayurvedic medications too.

Manifestations of chronic arsenic poisoning occur 2 - 8 weeks after ingestion[13]. Cutaneous manifestations would be hyperpigmentation, hyperkeratoses of palms and soles, erythroderma or Aldrich's mees lines in the nails[13,16,17]. The other manifestations would be mucositis[13], sensory motor polyneuropathy[13,18,19], portal hypertention[20], bone marrow supression[21] and causing cutaneous and visceral carcinoma[13,22].

In all of our patients erythroderma appeared 2 weeks to two months after ingestion of Ayurvedic medication. Only one patient (Case 2) had other cutaneous manifestations of chronic arsenic poisoning such as rain drop pigmentation and hyperkeratoses of palms and soles. None of them had other system involvement.

Confirmation of the diagnosis of chronic arsenic poisoning is done by doing estimation of the Arsenic levels in hair and nails and in the urine preferably following 24 hour course of Dimercaprol[13].

We couldnot do the quantitive estimation of arsenic due to lack of facilities.

The use of Dimercaprol in the treatment of chromic arsenic poisoning is contentious. Yet there are case reports, which show clinical improvement following a course of Dimercaprol[17,18].

The newer arsenic antidotes (2, 3-dimercaptopropanesuphonate sodium [DMPS], 2, 3 - dimercaptosuccinic acid [DMSA]) have low toxicity and high therapeutic index[23].

Since arsenic was detected in the hair and nails in our patients and, they had a history of recent intake of Ayurvedic medications, and in two of the occasions medication also contained Arsenic, we suggest that in these patients arsenic could have been the cause or precipitating factor of the erythroderma.

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