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# *SCHISTOSOMA HAEMATOBIUM* CONTROL IN KHOOZESTAN PROVINCE IN IRAN: PROSPERITIES AND FAILURES

**HAYATE MOMBENI, M.D., AND ALIREZA KHERADMAND, M.D.**

*From the Department of Urology, Golestan Hospital, Jundishapour Ahvaz Medical University, Ahvaz, Iran.*

## ABSTRACT

**Background:** *Schistosoma haematobium* is a parasite that is carried by freshwater snails and induces gastrointestinal and urinary disease, depending on its species. In Khoozestan, one of the provinces in Iran, schistosomiasis was endemic. This study reports the results of schistosomiasis control in this region.

**Methods:** From 1981 to 2001 nearly 650 villages and 20 cities were under surveillance for *S. haematobium*. More than 1.5 million urine samples were taken and positive cases were treated.

**Results:** From 1981 to 1990 there were 1158 positive cases; whereas, from 1991 to 2000 only 98 cases were reported and from 2000 to 2001 we could not detect any positive cases. The northwest of Khoozestan was the most infected area.

**Conclusion:** *Schistosoma haematobium* can be eradicated provided that a nationwide health care project comprising public health education, environment decontamination, case finding, screening, and chemotherapy is designed and held meticulously.

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**Keywords:** Schistosoma haematobium, Khoozestan, Iran, Disease control.

## INTRODUCTION

Schistosomiasis is the second most prevalent tropical disease following malaria.[1] In honor of Theodore Bilharz, in some parts of the world it is also known as bilharzia. He first identified the infective role of *Schistosoma haematobium* in Egypt in 1851.[2] The pathophysiology of schistosomiasis is according to the immune response of the host against the schistosome eggs. Characteristics of schistosomiasis depend on the species of the parasite, intensity of worm burden and immunity of the person to the parasite. *Schistosoma haematobium* is responsible for urinary symptoms and disease.[3] Globally, about 120 million, out of the 200 million infected people, are estimated to be symptomatic, and 20 million are thought to suffer from severe consequences of the infection. Yearly, 20000 deaths are estimated to be associated with schistosomiasis.[5] This mortality rate is mostly due to bladder cancer or renal failure associated with urinary schistosomiasis as well as to liver fibrosis and portal hypertension associated with intestinal schistosomiasis.[6]

*Schistosoma haematobium* is found in 53 countries, mostly in the Middle East and Africa. Reported achievements in schistosomiasis control have all consistently been linked to governmental support. Due to the availability of effective and safe single-dose drugs, chemotherapy has been considered as the main practical component of this strategy, supported by health education and transmission control through the provision of safe water and sanitation, snail control, and environmental management, where appropriate.[5]

**Correspondence:** Hayate Mombeini, Urology Department, Golestan Hospital, Ahvaz, Khozestan, Iran. Tel & Fax: +98(611)-3349293
E-mail: kheradmand_a@yahoo.com

According to the Iranian Health Organization Data, Khoozestan province in Iran is a region in which the prevalence of urinary schistosomiasis is in the highest degree.[6] In this study, we report the results of schistosomiasis control in Khoozestan and the current status of the area with regard to the disease prevalence in this province.

## MATERIAL AND METHODS

From 1981 to 2001 in all cities and villages of Khoozestan province, case finding and screening programs for *S. haematobium* were carried out. The program covered 280 to 672 villages, yearly. In addition, reports from physicians' offices, hospitals, and other heath centers were collected and recorded. In all patients presenting with bladder irritability symptoms and/or hematuria, urine examination for *S. haematobium* was performed. In all endemic areas (especially in the first years of the study) screening programs were done. All patients with positive results received chemotherapy against *S. haematobium.* In parallel with these programs, health education programs as grouping as well as face to face education were conducted and necessary information about the hazards of this disease, its complications, the life cycle of the parasite, and the ways of campaigning against it and the host snail were explained to the local inhabitants. Also, the people who had travelled to these areas were warned against the risk of being infected with *S. haematobium* and they were recommended to avoid water resources suspected to be contaminated.

Nearly 650 villages and 20 cities were under surveillance during a 20-year period and more than 1,500,000 urine samples were taken. Urine examinations were performed with dipstick and microscopic analysis. Because of the lack of facilities and trained heath personnel in some arduous areas, urine samples were collected there and transferred to reference laboratories.

Positive examination was defined as the presence of *S. haematobium's* eggs in the direct smear of patient's urine. Documented hematuria was described as suspicious cases.

## RESULTS

More than 1 million urine samples were taken in suspicious sites and examined for *Schistosoma haematobium* eggs. Most positive results were detected in the first three years of the study which gradually decreased. The number of positive cases in 1981 was 245, but in 2000 and 2001 was zero (Fig. 1). From 1981 to 1990 there were 1158 positive cases in our province, but from 1991 to 2001 only 98 cases were observed. This slump mainly occurred from 1981 to 1985 (Fig. 1) that was mainly due to our program for schistosomiasis control. Positive cases in 1981-1982 were 576, but in 1989-1990 were only 58 (90% decrease in positive cases).

In our study, the peak age of disease presentation was after 30 years (mainly 45 to 60 years). Males were infected 2.2 times more than females. The northwest of Khoozestan was the most infected area (Map 1).

## DISCUSSION

Measures of control in endemic areas for urinary schistosomiasis include several approaches: elimination of the snail host, protection from water of urine and fecal contamination and prevention of contact with contaminated water. Obviously, in many endemic areas, such measures are expensive, unfeasible or poorly

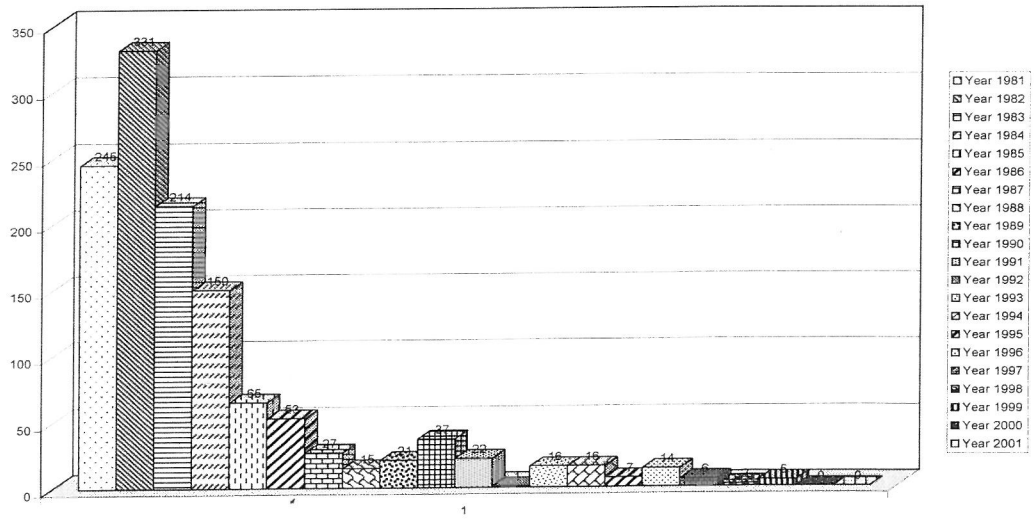


**Fig. 1.** Comparision of positive cases of *S. haematobium* in Khoozestan.

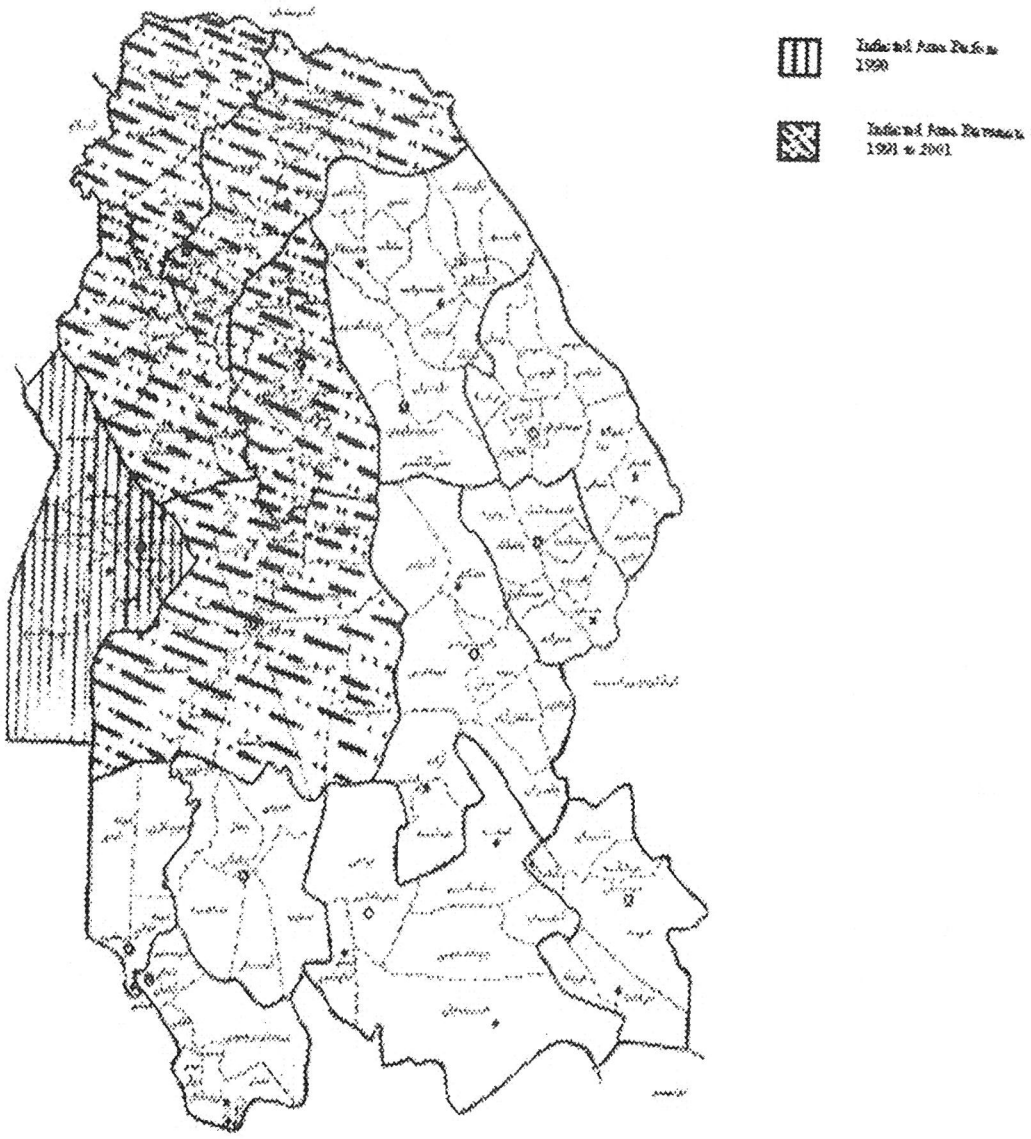

**Fig. 2.** Distribution of *S. haematobium* in Khoozestan.

tolerable by the local residents.[7] Hence, mass medical therapy by drugs has been emphasized with favorable short-time reported results, but its long-term effect is unclear. Achievements reported on schistosomiasis control have all consistently been linked to governmental support, the involvement of peripheral authorities and the allocation of local resources and the long-term implementation of a concerted control strategy.[8,9]

In our study we found that success in control of *S. haematobium* is possible when a public strategy for control is established. In our province, we can control the disease successfully with accurate programs based on health education, environment decontamination, case finding, screening, and chemotherapy.

Despite the absence of positive cases in years 2000 and 2001, it does not mean the elimination of disease and eradication of *S. haematobium* has taken place in our province, because there may be some patients who have refused to come to our centers, but we can precisely say that in comparison with the previous decade, control of the disease has taken place successfully in our province and it seems that today in Khoozestan this problem is limited to treating of disease complications such as bladder cancer and renal failure and not to finding of new cases.

## CONCLUSION

From our viewpoint, urinary schistosomiasis can be

controlled in affected areas. Since no positive case has been observed from 2000 in this area, and on the other hand, the measures of finding the patient affected by the disease is very expensive, it does not seem that now the application of mass screening for urinary schistosomiasis will be necessary and it is reasonable to serve our expenditures for public health education and biologic campaigning against this disease.

*Schistosoma haematobium* can be eradicated if we have a public program based on health education, environment decontamination, case finding, screening, and chemotherapy.

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