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**Review****The evolving schistosomiasis agenda 2017-2020 in Egypt:****Moving from control toward final elimination****Ahmed Abdelhalim Yameny**

Society of pathological biochemistry and hematology, Egypt

Ahmed A. Yameny (Email: dr.ahmedyameny@yahoo.com)DOI: [10.21608/JBAAR.2017.124633](https://doi.org/10.21608/JBAAR.2017.124633)**Abstract**

Schistosomiasis is one of the most important diseases of humans in tropical and subtropical parts of the world, it is a chronic disease, it comes after malaria in socioeconomic and public health importance among parasitic diseases. It is estimated that about 779 million people are at risk of infection, about 240 million are infected, of whom 120 million are symptomatic and 20 million have serious consequences (WHO, 2014). This infection has been recorded in Egypt from early pharaonic times (3200 B.C.) by the demonstration of *Schistosoma* eggs and circulating *Schistosoma* antigens in mummies. After the discovery of the parasite's life cycle in 1915, Egypt started to fight against the disease by implementing pilot projects using either snail control or chemotherapy. In Egypt, between 1989 and 1996, about 2.5 million schistosomiasis cases were diagnosed and treated, mentioning that the prevalence of schistosomiasis was close to 40% in 1983 at the national level. The Ministry of Health and Population in Egypt has announced the start of a campaign to confirm the final elimination of schistosomiasis by 2020 after the ministry has achieved success in reducing the prevalence of schistosomiasis to about 0.2% by the end of 2016.

Keywords: Schistosomiasis, public health, bilharzia, elimination of schistosomiasis, *S.haematobium*, and *S.mansoni*

1. Introduction

Schistosomiasis is one of the most important diseases of humans in tropical and subtropical parts of the world, it is a chronic disease, it comes after malaria in socioeconomic and public health importance among parasitic diseases, as regards the

frequency of infected people and the others at risk^(1,2). Schistosomiasis is reported to exist in 78 countries in the Middle East, South America, South-East Asia, and particularly in Africa. It is estimated that about 779 million people are at risk of infection, about 240 million are infected, of whom 120 million are symptomatic and 20 million have serious

consequences(WHO, 2014) ⁽³⁾. In Africa, schistosomiasis reported near to 300,000 deaths per year⁽⁴⁾. There was strong evidence from China, Brazil, and Egypt that morbidity due to schistosomiasis can be controlled in areas where the necessary financial resources exist. However, elimination as a public health threat has proved difficult ^(5,6), it is notable that the World Health Assembly in 2012 called, for the first time, for *Schistosoma* transmission interruption 'wherever possible' (WHA 65.21), However, the disease schistosomiasis will be ultimately abolished when reaching the goal of total elimination of *Schistosoma* transmission. Because many mass drug administration (MDA) programs have now obtained very low levels of *Schistosoma* prevalence⁽⁷⁾.

Schistosomiasis is a chronic, parasitic disease caused by blood flukes (trematode worms) of the genus *Schistosoma*⁽⁶⁾. Schistosomiasis, commonly known as bilharzia, is an acute and chronic tropical disease caused by trematodes of the genus *Schistosoma*⁽⁸⁾. The schistosome parasite is transmitted through a snail intermediate host with the human being the definitive host⁽⁹⁾. Schistosomiasis caused by both *S.haematobium* and *S.mansoni* has been considered a major public health problem in Egypt for several decades due to the high prevalence and morbidity of the disease, especially among rural populations ⁽¹⁰⁾. Manifestations of *S. haematobium* infection have been recognized in Egypt since the earliest times.

Hematuria known as AAA disease was mentioned in the Ebris the papyri ⁽¹¹⁾. This infection has been recorded in Egypt from early pharaonic times (3200 B.C.) by the demonstration of *Schistosoma* eggs and circulating *Schistosoma* antigens in mummies ⁽¹²⁾. Remedies for hematuria were recorded in papyri.^(13,14) The worms responsible for the

disease were eventually discovered in 1851 by Theodor Bilharz, a young German pathologist, from whom the disease took its original name, Bilharziasis. He discovered the causative agent of haematuria while performing an autopsy on a young man ⁽¹¹⁾. After the discovery of the parasite's life cycle in 1915, Egypt started to fight against the disease by implementing pilot projects using either snail control or chemotherapy ⁽¹⁰⁾.

2- Epidemiologic overview:

Epidemiological data on schistosomiasis were collected from the World Health Organization (WHO) preventive chemotherapy and transmission control Databank of systematic analysis for the Global Burden of Disease Study 2016 ⁽¹⁵⁾. Demographic data were collected from national offices of statistics(census), national plans of action for neglected tropical disease control, and from the United Nations (UN) population estimates which added yearly ⁽¹⁶⁾. Schistosomiasis is prevalent in tropical and subtropical areas, especially in poor communities without access to safe drinking water and adequate sanitation. It is estimated that at least 92% of those requiring treatment for schistosomiasis live in Africa⁽⁵⁾. At least 206.5 million people required treatment in 2016. However, those requiring treatment (targeted at most at-risk population groups) live in 52 endemic countries with the moderate-to-high transmission⁽¹⁷⁾.

Schistosomiasis was still an endemic disease in Egypt, despite all measures of Control up to 1997 ⁽¹⁸⁾. A changing pattern of schistosomiasis infection has been observed as *S.haematobium* is decreasing all over the country, especially the Nile Delta. In Upper Egypt, it is still the prevailing species but with variable levels of endemicity(table 1) ⁽¹⁸⁾ In Egypt, between 1989 and 1996, about 2.5

million schistosomiasis cases were diagnosed and treated, free of charge, every year by the Ministry of Health (MOH). During this period over 20 million doses of praziquantel were administered and annual reports in Egypt showed that the overall prevalence of both *S. haematobium* and *S. mansoni* declined steadily, year by year. For *S. haematobium*, the prevalence fell from 11.9% in 1988 to 5% in 1996, and from 16.4% to 11.9% for *S. mansoni* ⁽¹⁹⁾. According to WHO reports, the prevalence of *S. haematobium* in Middle and Upper Egypt

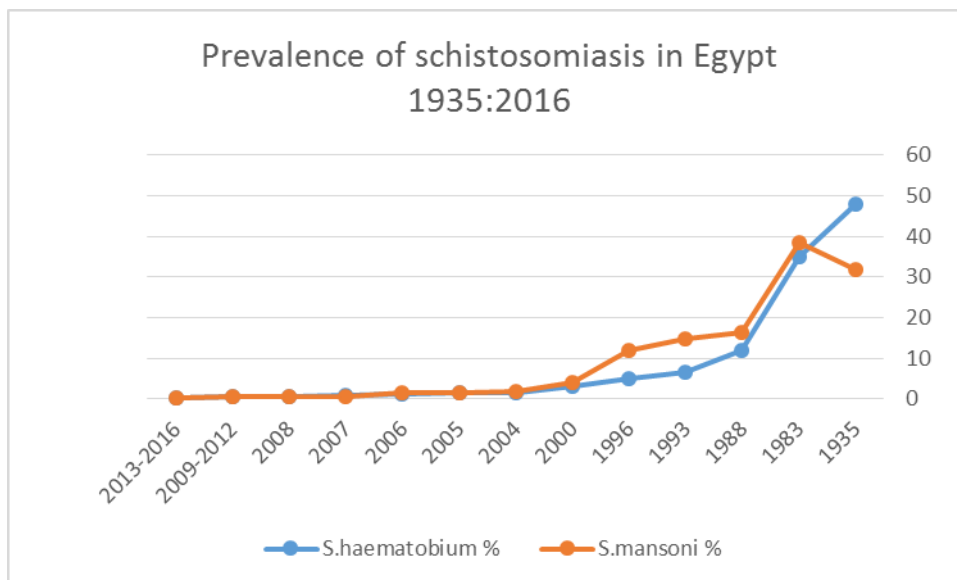
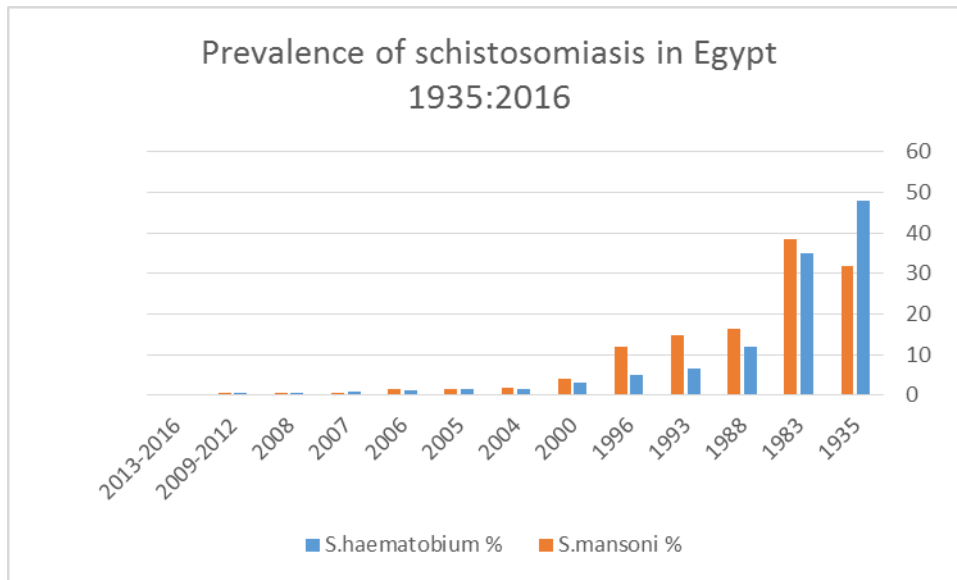
between the years 1969 and 1983 had varied between 22.6% and 45.7% but by 1998 was down to between 2.3 and 7.3% ⁽¹⁹⁾. By the end of 2004, both infections had been significantly reduced below 2%; *S. haematobium* with a prevalence of 1.6% in Upper Egypt and *S. mansoni* with a prevalence of 1.9% in the Nile Delta governorates ⁽¹⁰⁾. Between 2009 and 2012 reported rates were less than 0.5 % for both infections⁽⁶⁾. And between 2013 and 2016 reported rates from MOH were less than 0.2 % for both infections⁽²⁰⁾.

Table (1): Prevalence of schistosomiasis in Egypt ^(6,20-24)

| Year | * <i>S. haematobium</i> prevalence % | ** <i>S.mansoni</i> prevalence% |
|-------------|--------------------------------------|---------------------------------|
| 1935 | 48.0 | 32.0 |
| 1983 | 35.0 | 38.6 |
| 1988 | 11.9 | 16.4 |
| 1993 | 6.6 | 14.8 |
| 1996 | 5 | 11.9 |
| 2000 | 3 | 4.2 |
| 2004 | 1.6 | 1.9 |
| 2005 | 1.4 | 1.6 |
| 2006 | 1.2 | 1.5 |
| 2007 | 0.9 | 0.6 |
| 2008 | 0.6 | 0.6 |
| 2009 - 2012 | Less than 0.5 | Less than 0.5 |
| 2013 - 2016 | Less than 0.2 | Less than 0.2 |

**Schistosoma haematobium* represents a prevalence of urinary schistosomiasis in Upper Egypt.

** *Schistosoma mansoni* represent the prevalence of intestinal schistosomiasis in Lower Egypt



3. Elimination of transmission

The World Health Assembly in 2012 called, for the first time, for Schistosoma transmission interruption wherever possible. recognition of 'persistent hot spots' among treated villages within control districts indicates that we need to break both snail-to-human and human-to-snail transmission to fully prevent new infections. program of annual or every-other-year mass drug administration can control morbidity (schistosomiasis), but often without achieving any significant reduction in local parasite transmission (the process of *Schistosoma* infection)⁽²⁵⁾. However, the

disease schistosomiasis will be ultimately abolished when we reach the goal of total elimination of local *Schistosoma* transmission. Because many mass drug administration programs have now attained very low levels of *Schistosoma* prevalence⁽⁷⁾. Data for 2016 show that 34.4% of people requiring treatment were reached globally, with a proportion of 51.6% of school-aged children requiring preventive chemotherapy for schistosomiasis being treated. WHO coordinates the strategy of preventive chemotherapy in consultation with collaborating centers and partners from academic and research institutions, the private sector, non-governmental

organizations, international development agencies, and other United Nations organizations.

4. Moving from control toward the elimination of transmission in Egypt:

The Ministry of Health and Population in Egypt has announced the start of a campaign to confirm the final elimination of schistosomiasis by 2020 after the ministry has achieved success in reducing the prevalence of schistosomiasis to about 0.2% by the end of 2016. The campaign was started during the year 2017 by providing 14.5 million tablets of praziquantel and providing the insecticide for the control of snails and infested water with cercaria, treatment by targeting 6 million schoolchildren and citizens at a total cost of 40 million pounds including praziquantel, pesticide and covering the cost of health teams and watercourse treatment in cooperation with the World Health Organization⁽²⁶⁾. The head of the Central Administration of Endemic Diseases said the plan was based on four main axes: mass therapy, snail control, health awareness, and behavioral change, and environmental sanitation.

The campaign will be carried out in two stages. The first phase started on July 30th targeting one million and 35 900 citizens in 15 governorates: Alexandria, Gharbia, Ismailia, Menoufia, Damietta, Giza, Fayoum, Beni Suef, Qena, Sohag, Minya, Luxor, Aswan, and North Sinai, where the treatment was distributed to 573269 citizens during the first week, mass treatment of high prevalence areas is being done in 359 villages in 15 governorates and 8140 km of waterways in these governorates are being treated to eliminate the snail's intermediate host of schistosomiasis⁽²⁶⁾.

The second phase will start in October 2017 targeting 5 million students and citizens and treating about 10,120 km of waterways to control snails in five governorates: Bohaira, Kafr El-Sheikh, Dakahlia, Sharqia, and Qalyubia. Mentioning that the prevalence of schistosomiasis was close to 40% in 1983 at the national level, while schistosomiasis is a

health problem with social and economic levels. There are more than 300 villages in Egypt with a prevalence of more than 3%, especially among school children⁽²⁶⁾. Which require prolonged treatment and continuous examinations, reducing the prevalence of schistosomiasis to about 0.2% by the end of 2016, and completing that campaign to confirm the final elimination of schistosomiasis in Egypt by the year 2020.

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