

Niger Schistosomiasis Control Program: Current Status and Challenge

Zhiling Zheng, Fang Xu, Xue Dong

Shenzhen Longhua District Central Hospital, Shenzhen 518110, China.

Abstract: Schistosomiasis is a neglected tropical disease, caused by a parasite carried by freshwater snails. Schistosomiasis is a significant threat to public health in tropical and subtropical areas, especially in regions that lack clean drinking water and basic sanitary conditions. This essay critically evaluates the Niger schistosomiasis control plan. Relevant literature was reviewed, and an in-depth analysis of national and international data was conducted. The implementation of the national project in Niger was evaluated from political, economic, social, and cultural aspects, and the structure of Niger's health protection system was discussed, in terms of health coverage and universality of health care services. The role of health care practitioners in schistosomiasis control strategies was also discussed. The relationship between governments, regarding power and control of the project, was observed. Lastly, the impact of globalisation on the schistosomiasis control plan in Niger and other African countries was considered.

Keywords: Schistosomiasis; Control Plan; Niger

Background context

Freshwater snails act as intermediate hosts for schistosomiasis, causing urogenital diseases and intestinal diseases in affected humans. The incidence of this disease is high in rural communities, as people rely on not clean water sources for drinking, washing, bathing, and playing. Furthermore, fisherman and farmers often expose the community to contaminated water. When the larvae of schistosome come into contact with infected water, they usually penetrate the skin of humans, thereby causing infection. When the schistosome larva enters the human body, it develops into an adult and lives in the urethra and blood vessels. They lay eggs which embed in tissues, causing great harm to the affected person.

Schistosomiasis is the second endemic parasitic disease in Sub-Saharan Africa. Approximately 2.18 million people worldwide require preventive chemotherapy (PC) for schistosomiasis; Niger accounts for 92% of this, of which 3.5 million people need further treatment. In Niger, schistosomiasis is mainly caused by *schistosoma haematobium* and *schistosoma mansoni*, and whilst both are endemic, *s. haematobium* is more widespread. The main interventions for schistosomiasis in Niger are the use of praziquantel for deworming in schools, and selective chemotherapy for adults at high risk of infection.

Country description

Niger is located in West Africa and covers an area of 1.27 million square kilometres. It borders Mali, Libya, and Algeria, with Chad in the east and Benin, Nigeria, and Burkina Faso to the south. The total population is approximately 21.5 million. It is amongst the poorest countries, with a poverty rate of 41.4 % and half the population living below the poverty line.

Current status

In 2012, the London Declaration was signed with the support of fund donors, pharmaceutical companies, the global health agency alliance, governments in endemic countries, and non-governmental organisations, as part of a plan to tackle neglected tropical diseases. Since then, the number of people receiving PC in endemic countries has greatly increased. The SCI Foundation also implemented a sustainable strategy for schistosomiasis and soil-borne worms through the Ministry of Health of Niger; from this, 35,548,477 treatments were provided. Although the geographical and national coverage of

schistosomiasis treatment is 100%, data from schistosomiasis endemic countries has estimated that there are 3,681,910 people who need PC for schistosomiasis annually, alongside 1,380,713 school-age children.

Political

The turbulent political situation present in Niger has exacerbated the impact of schistosomiasis and has promoted the general spread of infectious diseases. Conflict can lead to the displacement of a large proportion of the population, leaving people without medical support or protection. There is also a lack of stable housing, clean water sources, and hygienic sanitation systems, as well as increased exposure to insect vectors. Crises including Boko Haram in northern Nigeria, the civil war in Libya, and the violent conflict in Mali forced a large number of refugees to migrate to Niger. Violent conflicts can lead to insufficient food and water, which increases the risk of disease transmission. In addition, medical facilities and basic sanitation facilities are often damaged or destroyed as a result of war, and health personnel may be forced to move due to the dangerous environment. Public health services are also limited due to road damage caused by conflict, and governments are often reluctant to send medical personnel to conflict areas due to inadequate transportation. Moreover, damage to the ecological environment may also increase the spread of pathogens. These conditions can prevent rural communities from accessing schistosomiasis treatment or may result in underreported cases of schistosomiasis. Therefore, the procedures implemented as part of mass drug administration programmes may be ineffective.

Economy

Niger's economy tends to be simplistic, with agriculture being the main contributor to economic development. According to World Bank data, although the Niger government has made great efforts to reduce the poverty rate, the extreme poverty rate remains high in 2019. The global coronavirus pandemic in 2020 resulted in the Niger government increasing its budget for health and social assistance services for vulnerable families; however, this will cause Niger's economy to become more strained. Meanwhile, the security requirements caused by conflicts have additionally weakened Niger's economic system.

There is a level of uncertainty about whether the SCI Foundation will receive additional funding in the future, which will impact the Niger schistosomiasis control project. The SCI Foundation accepts funding from the UK government for international development, but funding information has not been updated beyond 2022.

The health care system

The Ministry of Public Health of Niger is responsible for providing high-quality health care services for the people of Niger. There are ministers, general secretariats, three general administrations, and 17 national directions that are collaboratively responsible for the overall management of the national health system. Regarding health care, three national hospitals and a national obstetrics and gynecology reference unit provide health services for the people of Niger. In addition, eight regional public health bureaus jointly coordinate and supervise health operations and provide technical support to corresponding health areas.

In 2017, Niger's total health care expenditure accounted for 7.74% of the GDP. The per capita health expenditure is an average of \$29.26 USD, of which the per capita out-of-pocket expenditure is \$15.27 USD. To achieve the 2016-2020 strategic plan of the Neglected Tropical Diseases, the Ministry of Public Health of Niger established the NTDs National Coalition in 2019, which included 25 stakeholders. The use of financial and technical resources under multi-party cooperation would enable better coordination and would protect more people from diseases.

The lack of transportation, unstable climate, and inadequate infrastructure all prevent Nigerans from accessing superior medical services. Moreover, public transportation is only available in major cities. In most areas, transportation is mainly by foot or using animals. In addition, medical facilities in Niger are inconsistent. There are 11 regions without hospitals or maternity centres, and 6 regions that lack sanitation facilities. Consequently, local residents seriously lack access to essential health facilities.

Schistosomiasis control project

The schistosomiasis control project is a national-level plan in Niger. The government is responsible for the implementation of the strategy, whilst the SCI Foundation provides funds and the necessary drugs, consulting support, and analysis of results. The funding in 2019 was £390,722. The SCI Foundation was funded and established by the Bill&Melinda Foundation in the early stage. The main funding currently comes from multi-party donations and the United Kingdom International Development Department. In addition, the National Coalition on NTDs, organised by the Ministry of Health, has expressed that it will strengthen all aspects of its functioning, including treatment, financial support, government propaganda, disease surveillance and research, to complete the schistosomiasis control plan.

Discussion

China, Brazil, and Egypt are determined to eliminate this disease, but the spread in most Sub-Saharan countries is persistent. The NTDs in Sub-Saharan Africa cause approximately 534,000 deaths every year, which has a huge impact on the government and families of Niger. Because of this, the situation has attracted widespread international attention. A combination of the WHO joint research institute, private sector entities, non-governmental organisations, and international development agencies have provided support to overcome the existing issue. For many years, numerous strategies to control the spread of schistosomiasis have been formulated. There has also been support from pharmaceutical companies, such as Merck, who have a cooperative relationship with WHO since 2007. These companies donate PZQ to African countries for free every year until schistosomiasis is completely eliminated.

Although the control strategy has significantly reduced the incidence of the disease, compared with other NTDs, the progress of schistosomiasis is relatively slow. The global strategy of treatment measures should be reevaluated. In countries where the drug coverage rate has not reached the 75% target, updating and formulating new strategies should be prioritised, focusing on resources, drugs, and follow-up plans. In countries where the drug coverage rate has reached 75%, cases should continue to be supervised, to prevent repeated infections.

Conclusion

Schistosomiasis remains a global threat to the health and survival of numerous populations. Although great progress has been made in recent years with the cooperation of international organisations and governments, African countries need to continue to make concerted efforts to implement interventions, whilst aiming to alleviate the existing poverty issue. Sub-Saharan countries should provide sufficient clean water and basic sanitation facilities and should continue to increase public awareness of diseases to help control diseases. Furthermore, medical systems need immediate improvements to provide residents with stable and comprehensive medical protection. Most importantly, freshwater snails should be controlled as a way of reducing the spread of diseases through these sources of intermediate hosts. Overall, controlling NTDs can achieve a range of sustainable development goals.

References

- [1] Adenowo, A.F., Oyinloye, B.E., Ogunyinka, B.I. and Kappo, A.P., 2015. Impact of human schistosomiasis in sub-Saharan Africa. *Brazilian Journal of Infectious Diseases*, 19(2), pp.196-205.
- [2] Bygbjerg, I.C., 2010. Conflicts and vector-borne diseases. *Ugeskrift for Læger*, 172(2), pp.112-116.
- [3] Blanford, J.I., Kumar, S., Luo, W. and MacEachren, A.M., 2012. It's a long, long walk: accessibility to hospitals, maternity and integrated health centers in Niger. *International journal of health geographics*, 11(1), p.24.
- [4] Belaid, L., Dagenais, C., Moha, M. and Ridde, V., 2017. Understanding the factors affecting the attraction and retention of health professionals in rural and remote areas: a mixed-method study in Niger. *Human resources for health*, 15(1), p.60.
- [5] Bengu, M.D., Dorsamy, V. and Moodley, J., 2020. Schistosomiasis infections in South African pregnant women: A review. *Southern African Journal of Infectious Diseases*, 35(1), p.7.