

SNAKEBITE POISONING IN BRAZIL: SHAMEFUL, UNACCEPTABLE MORBIDITY AND LETHALITY

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In 2003, the World Health Organization (WHO) launched a programme aiming to control and to eliminate a group of neglected tropical diseases¹. However, the Ninth Meeting of the Strategic and Technical Advisory Group for Neglected Tropical Diseases (STAG)², that took place on 12–13 April 2016, reinforced that snakebite poisoning should not be in the selected group of the 17 neglected tropical diseases tackled by WHO programmes. However, snakebite poisoning presents typical profile of a neglected tropical disease³: it is an important cause of morbidity and mortality, predominantly among peasants and poor people living in tropical and sub-tropical areas; feasibility of control, elimination or eradication; and have received scarce investments for research for development of new medicines, diagnostics and control tools.

Snakebite poisoning morbidity can be greatly reduced by the use of cheap and simple Individual Protective Equipment, like boots for agricultural workers. Lethality depends mainly on ready and adequate antivenom therapy (AV).

Venomous snakes prevail in rural areas of developing countries of Latin America, Africa, Oceania and Asia. In these areas, official epidemiological statistics about cases of snakebite poisoning are scarce or simply do not exist.

In Brazil, from 2010 to 2015, 163,190 cases were notified, representing a mean 27,200 cases per year or 75 cases per day. Concerning the same period, 714 deaths by snakebite poisoning were reported, yielding a lethality of 0.4 deaths per 100 cases. These figures can be compared with data for other diseases, notified for the same period of time, by the same data source⁴: visceral leishmaniasis - 21,519 cases, 1,450 deaths, lethality = 6.7%; leptospirosis - 23,714 cases, 1,981 deaths, lethality 8.3%; schistosomiasis mansoni - 65,371 cases, 323 deaths, lethality = 0.5%.

One appalling aspect of snakebite poisoning is the disproportionate incidence among agricultural workers, usually poor and vulnerable. In Northeast Brazil, the mean incidence of snakebite poisoning, for the

period 2000-2009, was 29.3 cases/100,000 among agricultural workers and 8.2 cases/100,000 among non-agricultural workers⁵.

In the State of Bahia, Brazil, the incidence of snakebite was positively and strongly associated with municipality characteristics: planted areas of cocoa and coffee, and the size of domestic bred chicken and bovine livestock⁶.

During school years, medical students are well trained on diagnostics and treatment of some tropical diseases like visceral leishmaniasis, schistosomiasis, and leptospirosis. But this does not happen concerning the diagnostics and treatment of snakebite poisoning. Because of lack of knowledge about these cases, most physicians just refer their patients bitten by snakes to a antivenom reference center, without taking any antivenom measure. The time expended, while looking for the nearby antivenom center, may be crucial for the patient's health. Short time-to-treatment is essential to the case favourable evolution.

We made some preliminar analyses of data on the lethality of agricultural workers in Brazil, 2004-2015.

We found that some drawbacks still occur in the management of cases attended in antivenom centers, contributing to increase snakebite poisoning lethality, due to: a) the serum can simply be unavailable in the center; b) the type of the serum given to the patient can be inadequate to the snake that caused the accident. Five types of antivenom sera should be available to treat Brazilian snakebites; c) only a small number of ampoules is given to the patient. We should not blame only the Brazil's doctors and antivenom centers for the high incidence and high lethality of snakebites. The confrontation of this issue involves, at least, the coherent distribution of antivenom serum, continuous training of health care team, and health measures to protect farmers, the most vulnerable occupation to snakebites.

The serum presently used in Brazil is liquid, needs to be kept refrigerated (2-8 °C) to prevent its denaturation, and its shelf life is relatively small (about three years). A lyophilized version of snake antivenom, more stable and durable, already

exists in Europe. Therefore, it's urgent to expand the production and availability of lyophilized antivenoms that are indicated to the snakes types found in Brazil. Further, more research is needed concerning the production of polyvalent serum, that could prevent errors in antivenom therapy. There have been some advancements in the knowledge about this subject, but there is still much to evolve in the prevention, diagnosis, and treatment of snakebite poisoning. Snakebite poisoning shameful and unacceptable morbidity and lethality keeps on challenging Brazil.

REFERENCES

1. World Health Organization. First WHO report on neglected tropical diseases: working to overcome the global impact of neglected tropical diseases [Internet]. 2010. Available from: http://apps.who.int/iris/bitstream/10665/44440/1/9789241564090_eng.pdf
2. World Health Organization. Report of the WHO Strategic and Technical Advisory Group for Neglected Tropical Diseases [Internet]. 2016 [Cited 21 May 2017]. Available from: http://www.who.int/neglected_diseases/NTD_STAG_report_2016.pdf?ua=1
3. The WHO strategic and technical advisory group for neglected tropical diseases (WHO STAG). Recommendations for the adoption of additional diseases as neglected tropical diseases [Internet]. 2017. [Cited 21 May 2017]. Available from: http://www.who.int/neglected_diseases/diseases/Adoption_additional_NTDs.pdf?ua=1
4. Brasil. DATASUS. Informações de saúde. Epidemiológicas e de morbidade [Internet]. [Cited 22 May 2017]. Available from: <http://www2.datasus.gov.br/DATASUS/index.php?area=0203&id=29878153>. Portuguese.
5. Mise YF. Aspectos epidemiológicos do ofidismo no Nordeste brasileiro [PhD Thesis]. Salvador: Universidade Federal da Bahia; 2014. Portuguese.
6. Mise YF, Lira-da-Silva RM, Carvalho FM. Agriculture and snakebite in Bahia, Brazil - An ecological study. *Ann Agric Environ Med*. 2016; 23(3):467-470. doi: [10.5604/12321966.1219179](https://doi.org/10.5604/12321966.1219179)