

Short Communication

The Need for a Coordinated One Health Approach to Combat Rabies in South Asia

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Abstract

Rabies is a vaccine-preventable viral disease present in more than 150 countries around the world. Globally, almost 60,000 people die each year from rabies, of which more than 58 per cent are in South and Southeast Asia with especially high incidence in India, Pakistan and Bangladesh. Vaccination coverage of both people and stray dogs is low in the region and in general people are not given enough protection and information about pre- and post-exposure prophylaxis. Engagement of multiple sectors and One Health collaboration including community education, awareness programmes and vaccination campaigns are critical.

ABBREVIATIONS

FAO: Food and Agriculture Organization; OH: One Health; PEP: post-exposure prophylaxis; SAARC: South Asian Association for Regional Co-operation

INTRODUCTION

South Asia comprises the countries of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The region has a total area of 5,134,641 square km, a population in excess of 1.8 billion who occupy the land at a density of 362.3 people per square km. About one quarter of all people falls below the international poverty line and, although there are some enormous cities, 70 per cent of people live in rural areas.

Neglected infectious zoonotic diseases, of which rabies is one, have a disproportionate effect on the health of marginalized poor people. Globally, almost 60,000 people die each year from rabies, of which more than 35,000 (58 per cent) are in South and Southeast Asia. India, Pakistan and Bangladesh are known to have a high incidence but no quantitative data are available [1]. Human rabies is a fatal viral disease largely transmitted from bites by infected animals, predominantly domestic dogs. The disease is entirely preventable through prompt administration of post-exposure prophylaxis (PEP) to bite victims and can be controlled through mass vaccination of domestic dogs. Rabies is notoriously under-reported because most deaths in low income countries occur at home and is therefore often neglected. Vaccination of domestic dogs is not widely practiced and access to PEP is most limited in low income countries. More focus on dog vaccination could eliminate the disease at source which would reduce the need for PEP and prevent the huge and largely unnecessary mortality in communities at risk [2,3].

Most South Asian countries have large and predominantly unvaccinated dog populations both “domestic” and free-roaming. Poor sanitary conditions in rural and urban areas favour an increase in roaming dog populations. The risk of contracting rabies is real. The effects can disrupt human interaction in social security, development, trade and tourism. The possibly exceptional economic and social consequences must be confronted in an effective and efficient manner, so as to grasp the profound impact of transmissible pathogens and especially on human health and welfare [4].

South Asian countries already have some political and public support for rabies elimination but levels vary across the region. Animal rabies control and management, access to vaccination for human rabies and better public awareness are keys to success. The “prevention at the source” approach through control by vaccination in the canid reservoir can provide cost-effective [4]. It has been suggested that 70 per cent or greater of dogs should be vaccinated to prevent epidemics and to eliminate endemic rabies [5]. Under South Asian conditions, however, it would be difficult to achieve such coverage. It is nonetheless important to set realistic region-specific vaccination goals.

Animal welfare organizations and other charities conduct mass awareness campaigns and neutering and vaccination programmes in attempts to control rabies but most have a presence only in urban locations leaving rural areas at higher risk. In general, South Asian countries do not achieve coverage that is sufficient to reduce the incidence of rabies [6].

Various type of control policies have been adopted or practised in many Asian countries. Different Asian countries have developed different types of control policies against rabies [7]. In Brunei Darussalam for example, the country maintains its rabies-free status and attempts to curtail import of the disease

from other countries. Cambodia employs an early warning system for detection and investigation of and response to the disease and has reduced the disease to a very low level. Several anti-rabies strategies are employed in Indonesia including vaccination, rapid response, and communication of information, routine surveillance, management of the canine population and integrated bite management [7].

MATERIALS AND METHODS

This paper is the result of the work and knowledge of both authors in Nepal complemented by discussions with and advice from various stakeholders.

RESULTS

The one health approach

The One Health (OH) approach is at a rudimentary stage in much of South Asia in spite of funding and advice from the major international organizations. The principal reasons are limited political support, an inappropriate legal framework, a dearth of technical expertise, budgetary constraints, limited data sharing mechanisms and lack of coordination among the various components that should be promoting and implementing OH activities [8,9]. Nepal is a good example of the problems of OH [10]. India has similar problems to those of Nepal whereas Bangladesh has an ambitious health policy at national level and a separate framework for infectious disease control under an organized OH approach [11].

Regrettably, three of the region's biggest countries (India, Pakistan and Bangladesh) are among the world's top five rabies endemic countries [3]. The OH approach has been found helpful in controlling zoonoses and has been practised effectively in some countries over several years [10]. Bhutan, Sri Lanka, and Bangladesh in South Asia have successfully reduced deaths from rabies over time using the OH approach.

Human population increase, urbanization, invasion of farmland and forested areas has resulted in closer and more constant contact between people and wildlife. Exchange of pathogens, including rabies, occurs at the interface between humans and animals [12]. Although the true extent of human mortality is unknown because of massive under-reporting rabies has been accorded priority status for the OH approach in South Asia. A multi-sectoral, OH approach would facilitate the promotion of actions for all sectors but would impose only one cost (mass dog vaccination costs are borne by the animal health sector, but provide important benefits to public health) [12]. The World Health Organization (WHO), the Food and Agriculture Organization (FAO) and the South Asian Association for Regional Co-operation (SAARC) independently help to strengthen the OH approach for rabies prevention in the region. A regional comprehensive integrated rabies control programme has been established with funding from the WHO's South East Asian Regional Office [12]. FAO's Regional Support Unit for SAARC incorporates OH components where possible. The One Health Alliance of South Asia (OHASA) network, involving wildlife, livestock and human health scientists and policymakers from Bangladesh, India, Nepal and Pakistan aims to develop transboundary and interdisciplinary approaches

to the prevention and control of zoonotic disease outbreaks [12,13]. The main animal and human health concerns have been identified as zoonotic influenza, canine mediated human rabies and antimicrobial resistance [14]. Each problem has an impact or effect on animal, human and environmental health in some cases and is most likely to be overcome by working in collaboration or providing information to multiple sectors. A Regional Capacity Building project under EcoHealth (OHASA) addresses training of trainers holds health days for public awareness and mass vaccination of dogs.

Eradication of rabies in several Asian [6] and some European [15] countries using a collaborative OH approach provides an excellent example to South Asian countries. The initiatives of welfare and other charitable organizations are important in creating increased awareness of pre- and post-exposure prophylaxis. Control measures known to be effective could lead to the elimination of rabies in the not too distant future. Such a situation would result in improved human health, lower healthcare costs and increased livelihood benefits.

Progress has been made in institutionalizing OH in some South Asian countries but there is a need for further behavioural, attitudinal and institutional transformation to enhance OH. Training in and the implementation of integrated zoonotic control policies that are sustainable are also required. Deficiencies in the institutionalization of the OH approach in South Asia include a lack of relevant scientific information and a culture of collaboration in the development and implementation of integrated zoonotic disease management policies as well as the continuing need to support transdisciplinary OH research and politically based policy-relevant capacity building programmes [9].

The numbers of people bitten by dogs are increasing in much of South Asia. Control has been ineffective due to a general lack of awareness for pre-exposure and post-exposure prophylaxis. Low vaccine efficacy due to a failure to follow the proper cold chain procedures and possibly poor vaccine quality are further problems. Rabies is incurable but it is preventable. Active participation and collaboration with and among farmers, animal health workers, veterinary professionals, medical professionals, politicians and a range of other stakeholders in OH approach is required. Achieving this type of action is compounded in the South Asian region due to diverse cultures and traditions and to political instability [16].

Actions required

Investigations of the bio-social conditions that contribute to dog-human confrontation are needed and actions must be implemented to mitigate the negative impacts (one example of a confrontation zone relates to the large heaps of waste fetid household food and other detritus where dog fights are common). Local knowledge should be tapped and built upon to develop techniques and materials for relatively safer cohabitation.

Under-reporting of the incidence of rabies and the current lack of cooperative and collaborative working among stakeholders mean there is a pressing need for a systematic application of OH in South Asia to control and eliminate rabies. Improvement of surveillance of animal and human rabies should be based on improving case definitions and standardizing clinical reporting

and laboratory confirmation. Epidemiological and sociological surveys are needed in order to determine the order and magnitude of risk factors. Vaccination of household and street dogs, euthanasia of (suspected) rabid dogs, sterilization of stray dogs, establishment of dog management areas, education of children and adults in prevention of bites, health care provision and post-exposure prophylaxis are essential to eliminating the scourge of rabies.

CONCLUSION

The best pathway to rabies control and elimination appears to be the OH one. OH requires coordination and exchange of actions and data among all parties and across all disciplines and countries. It is also important to provide educational programmes for young people that highlight the importance of wound treatment and the need for post-exposure prophylaxis. All this is feasible through a coordinated OH approach in achieving soft goals of rabies prevention and eradication in the South Asian region.

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