Proceedings

of

National Convention

on

Zoonotic Diseases: Present Status and Future Road Map

on

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Preamble

Out of 1.2 billion population of India, more than 65% population is dependent on agriculture and animal husbandry. Majority of the farmers have small animal holdings and live in close contact with animals. This unique situation needs more risk of transmission of diseases from animals to humans. It is found that out of 1407, known human pathogens, 816 (58%) are capable of being transmitted naturally between animals and human. These 58% includes all bacteria, virus, prions, ricketsia, fungi, protozoa, helminthes and microspordia. WHO in 2007 discussed the status of zoonoses in South East Asia during its regional meeting held at Jakarta. Rabies which is being transmitted through animal bite especially through dog bite is one of the most dreaded disease. As per recent data, in India, 15 million people are bitten by dog. Brucellosis, which is another important zoonotic disease, is rampant in bovine population with prevalence of 20% or more. In rural India, where bovine tuberculosis is a serious problem, also play very important role in human tuberculosis. Salmonellosis, listeriosis, Japanese encephalitis, avian influenza, SAARS, leptospiosis, anthrax, cysticercosis, plague, cow pox, scabies, tetanus and anthrax are some other more important zoonotic diseases, being transmitted from animal to human being.

About 75% of the new diseases that have effected human population over the past 10 years have been caused by pathogen originating from animal or from products of animal origin. Food born diseases remain the significant cause of morbidity and mortality in both developed and developing countries. Food born diseases may cause up to 76 million illnesses, 3, 25,000 hospitalizations and 1800 death each year in India. Five most important emerging food born pathogens are campylobacter, salmonella, enteroheamorrhagic E. coli, Toxaplasma gondi and cryptosporidium species.

Many of these zoonotic diseases have the potential to spread, through various means, over very long distances to become threat and challenges. In addition, to direct adverse on health of human being, all the major zoonotic diseases also prevent the efficient production of food of animal origin and create obstacles in international trade of animal and animal product. The zoonotic are thus an impediment to over all socio-economic development of nation.

Creating awareness of zoonotic disease among the stake holder, consumers, traders and policy maker will help on prevention of zoonotic disease and the production of quality livestock products. I am sure that recommendation which have been drawn from the national convention on "zoonotic disease: Present status and future road map" would be very fruitful in prevention and preparation of future road map of containment of zoonotic diseases.

Proceedings and Recommendations of Scientific Session-I

The technical session was chaired by Prof. (Dr.) M.L. Madan and co-chaired by Dr. Lal Krishna. Dr. R.K. Singh acted as rapporteur. Five lectures were presented during this Session.

1. Prof. (Dr.) M. P. Yadav emphasized on "Bacterial zoonotic diseases and their importance in health and food science". While listing major bacterial zoonotic diseases and their impact on human health, food and nutritional security, animal health, productivity, profitability and trade of livestock and livestock products, he emphasized the need for creating state of the art diagnostic facilities to meet WHO/OIE requirements. He further elaborated on the use of rapid pathogen detection techniques for livestock, poultry and fish diseases as well as any disease pathogen concerning food processing industry, following HACCP which would help in quality assurance of the product and ensure the safety of consumers.
2. Dr. H. K. Pradhan gave a detailed overview on the "Importance of highly pathogenic avian influenza (H5N1)" and emphasized on various modes of virus transmission, diagnosis, zoonotic aspect, control strategies like culling, vaccination or a combination of both, and drug resistance.
3. Dr. G. Saikumar gave an account on "Zoonotic swine influenza among Indian pigs" and an overview on the importance of swine influenza in Indian context. He described an outbreak of Swine influenza in Pigs of Uttar Pradesh with molecular characterization of virus isolate. He emphasized on rigorous surveillance against swine flu in various parts of the country to study its epidemiological dimensions.
4. Dr. R. K. Singh dwelt upon "Cross-species transmission of influenza A viruses and zoonosis with a focus on equine influenza (H3N8) virus". He discussed about the epidemiology and ecology of virus which is the major challenge. He gave a detailed account on the characterization of Indian isolates of equine influenza virus during recent years and showed the preparedness of National Research Centre on Equines on the development of new generation diagnostics and vaccine to combat the A/Equine-2 virus infection in equines.
5. Dr. B. Pattnaik gave a detailed overview on the "HACCP approach for management of infectious and contagious zoonotic diseases". He emphasized on the identification of critical control points for effective and timely control of infectious diseases and suggested for establishment of an institute for Veterinary Epidemiology and Disaster Management.

Recommendations

- Need for National Biosecurity Policy and establishment of National Biosecurity Council or Authority (ICAR; DAHD&F, GOI)
- Initiating National Control of more animal diseases like sheeppox, goatpox, TB, and ParaTB, besides Brucellosis and PPR what DAHD&F has already initiated.
- Need for a National Center of Excellence/ Institute for Veterinary Epidemiology and Disaster Management. (DG/DDG(AS), ICAR; DAHD&F, GOI)
- More BSL-3 and BSL-4 labs in the country.
- Development of DIVA strategy for infectious animal diseases (Action: ICAR)
- Trained human resources in animal disease epidemiology, risk analysis, assessment and management, HACCP, Biosafety and Biosecurity (Action: ICAR).

Capacity building

1. Lab infrastructure I). Wet Labs and ii). Dry Labs.
2. Trained human resources in animal disease epidemiology, risk analysis, assessment and management, HACCP, Biosafety and Biosecurity (Action: DG/DDG(AS), ICAR; Director, IVRI).
3. Lab networking.(Action: DAHD&F, GOI and ICAR)
4. Multi-disciplinary teams.(Action: ICAR; DAHD&F; State Vety/AH Departments)
5. Bio-safety/ Bio-security.(Action: ICAR;DAHD&F,GOI; State Vety.&AH and Fishery deptts;Vety./Animal/fishery Science Universities)

Proceedings and Recommendations of Scientific Session-II

Scientific session II was chaired by Dr. M. P. Yadav, while Dr. B. Pattanaik acted as co-chairman and Dr. Sai Kumar as rapporteur. This session had five presentations.

- Dr. P. D. Juyol, discussed about "Emerging and Reemerging Food Borne Parasitic Zoonoses in India". He suggested that use of molecular epidemiological investigation along with capacity building, health education and controlled slaughtering of food animals can be useful to control parasitic zoonoses in India.
- Prof. (Dr.) P. P. Gupta, discussed at length on the "Diagnosis of Zoonotic Mycotic Diseases in Animals and Human". He emphasized about the increasing complications due to mycotic diseases in AIDS and usage of immune-suppressive drugs. He also stated that absence of pathognomonic lesions and inadequate diagnostic expertise and facilities for mycotic diseases could further complicate their diagnosis, prevention and control.
- Dr. Gaya Prasad, made his presentation on "Future Strategies to Prevent and Control Zoonotic Diseases". He discussed about the factors which are responsible for emerging and re-emerging diseases and their economic impacts in various countries. He stated the importance of vigilance at grass-root levels in checking the spread of zoonotic diseases.
- Dr. Manish Kakkar, discussed about the "Roadmap to Combat Zoonoses in India (RCZI) Initiative: Building a Case for Inter-sectoral Collaboration". He described India as a hot spot of emerging and re-emerging zoonotic diseases with evidence of recent data and achievement of their five year programme as road map to control zoonoses
- Dr. Manish Kakkar in another presentation discussed about "WHO initiatives to deal with emerging zoonoses". He discussed various initiatives which have been taken on emerging zoonoses by WHO, like GPHIN & GOARN etc.

Recommendations

- Effective surveillance and monitoring of zoonotic diseases with sensitive tools
- Establishment of a National Epidemiology and Disaster Management Institute
- Awareness on the zoonotic diseases
- Collaborative research work between veterinary, medical institutes/laboratories and all stake holders
- Establishment of a "National Authority on Zoonoses" to coordinate the diagnosis, reporting and management of zoonotic diseases (Action: MH & FW, GOI; Min.Agric., GOI)

Proceedings of Brainstorming & Wrap up session

The brain storming and wrap up session session was chaired by Dr. Dr A Ahmed and co-chaired by Dr H K Pradhan. Dr Manish Kakkar acted as the rapporteur. The panellists were: Dr N Garg, Dr JL Vegad, Dr Lal Krishna, Dr PN Khanna and Dr Gaya Prasad.

Recommendations

Recommendations should be followed by action and thus prioritization is needed both within and between sectors to advance zoonoses prevention and control. These include arriving at a common list of zoonoses and corresponding interventions for their effective control between human and animal health sector that could be targeted on a priority basis (HK Pradhan).

All sectors should converge and identify common goals for mutual benefit and effective action (ML Madan).

ACTION: Identify list of priority zoonoses and list the intervention, identify agencies for implementation of these interventions and assign roles and responsibilities.

Identify and create mechanisms for greater and more frequent interaction between stakeholders in different sectors related to zoonoses prevention and control (Gaya Prasad).

ACTION: Map all the mechanisms and platforms available for working on zoonoses prevention and control; disseminate the information as far wide as possible

Political will is necessary for success of any initiative. The initiative could thus take the form of a national mission on zoonotic disease control. The initial push could come from the good offices of ICAR and NAVS (MP Yadav & ML Madan).

ACTION: As an initial effort, a base paper may be developed from this consultation advocating for the above and lager collaboration between sectors. This will also serve as a sign of commitment from the veterinary sciences sector. In addition to governmental agencies and departments, this policy paper should be shared with inter governmental agencies, NGOs, international organizations and private sector as well for more inclusive movement.

In prudent public health decision making, structure should follow function; function should not follow structure. Since the problem at hand i.e. prevention and control of zoonoses that have multi factorial determinants, there needs to be flexibility in the type of approach that could allow greater inter sectoral collaboration and coordination. Several mechanisms are possible and the success could be very context specific. All these possibilities be explored before preparing for a large scale initiative (Manish Kakkar).

Epidemiological investigation is central and critical to zoonotic disease prevention and control. Both veterinarian and para veterinarian support is inadequate in peripheries where they are needed the most. Veterinary epidemiology capacity is lacking in India. An important reason is the lack of expertise within veterinary academic institutions as well as diminishing emphasis on the discipline in these institutions. Hence, veterinary epidemiology function should be strengthened in both curricular and research initiatives. (RK Singh, Manish Kakkar and A Ahmed).

At the same time, veterinary epidemiology should move hand in hand with biological sciences without which it is an incomplete function. Moreover, there is a need to develop the concept and a cadre of field veterinarians who should then be teaching and mentoring others. Veterinary college faculty may not be most appropriate resource to take up this function unless they are groomed in to take up this role (ML Madan).

ACTION: Advocate for increased uptake of undergraduates in veterinary and para-veterinary training institutions. Popularize the discipline of veterinary epidemiology and veterinary public health. Greater collaboration is needed with medical institutions to provide holistic training for zoonoses prevention and control.

Quality of veterinary epidemiological surveillance and disease reporting systems has declined over the years and there is a need to strengthen this function to make use of the networks for early warning and control of diseases events in animals. Some of the 'out-of-the-box' solutions that have been tried include involvement of farmers community through use of telephone hotlines e.g. in Punjab by GADVASU and Maharashtra (A Ahmed, Madan). At the same time, reporting of disease events in animals must be encouraged; officials should not be castigated for such acts (MP Yadav). For effective prevention and control of zoonotic diseases, greater private sector and NGO involvement is critical (Gaya Prasad).

ACTION: The leadership for these reforms should come from departments of Animal Husbandry at central and state levels. Clear roles could be identified for research organizations and academic institutions that could then support these initiatives.

While lot needs to be done and the public health community is struggling to find a feasible model to operationalize 'One Health' concept, several models are available which could be studied and potentially scaled up, at least in part or in combination with other existing initiatives, for effective zoonoses prevention and control. These best practices should thus be well documented and disseminated as far wide as possible amongst the stakeholder (Manish Kakkar).

Often planning and preparedness strategies result in duplication of efforts due to lack of information on existing infrastructure and expertise in the country in different sectors. Similar hampering effect is seen on response capacity especially in peripheries. Mapping of resources on zoonotic disease prevention and control in the country is thus needed urgently (HK Pradhan and Manish Kakkar).

ACTION: Document best practices on zoonoses prevention and control in India and map the technical resources (training, research and implementation) available in the country)

Summary and Recommendations

- Capacity Building in Biosecurity
  - o Need for National Biosecurity Policy and establishment of National Biosecurity Council or Authority (ICAR; DAHD & F, GOI)
  - o Development of DIVA strategy for infectious animal diseases (Action: ICAR)
  - o Trained human resources in animal disease epidemiology, risk analysis, assessment and management, HACCP, Biosafety and Biosecurity (Action: ICAR).
  - o All research institutions to have BSL-2 facilities for education, teaching, and research. More BSL-3 and BSL-4 labs in various geographical areas in the country required (Action: ICAR/ICMR/CSIR/MoHRD, MoA, etc.).
- Initiating National Control programmes for more animal diseases like sheep pox, goatpox, TB, and ParaTB, besides Brucellosis and PPR what DAHD & F has already initiated (Action: DAHD & F, GoI).
- Capacity Building for effective National Disease Surveillance
  - o Researchable issues include concerted efforts in developing:
  - (a) Rapid/sensitive/effective/user-friendly diagnostics including the pen-side tests/kits and tests suitable for testing samples at mass-scale during surveillance and sero-monitoring (Action: ICAR/ICMR/CSIR/Universities).
  - (b) New generation vaccines for mass vaccination programmes (Action: ICAR/ICMR/CSIR/Universities).
  - o National network on surveillance including a "National Sample Grid" for samples from animal origin (Action: ICAR/ ICMR/ CSIR/ Universities/ DAHD&F/ State AH Departments).
  - o Need for a National Centre of Excellence/Institute for Veterinary Epidemiology, Economics and Disaster Management (DG/DDG(AS), ICAR; DAHD&F, GoI).
- Capacity building on zoonoses
  - o Prioritization of zoonotic diseases (Action: ICAR/ ICMR/ CSIR/ Universities).
  - o Effective surveillance and monitoring of zoonotic diseases with sensitive tools (Action: ICAR/ ICMR/ CSIR/ Universities/ State AH deptts).
  - o Set-up a state-of-the-art facility for research on zoonoses like a National Institute on Zoonoses with branches in different geographies in the country (Action: ICAR/ICMR).
  - o Fostering inter-ministerial and inter-departmental collaboration on public health issues (Action: GoI)
  - o Strengthening medical and veterinary Public Health (Action: Federal and state Governments).