

Therapeutic vaccination for the control of Johne's disease using native strain of *Mycobacterium avium* subspecies paratuberculosis in animals: Can it be a model for the control of TB and leprosy in human beings and animal TB globally?

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Mycobacterial infections plagued human and animal populations since existence of life on earth causing more miseries in the two species than all the bacterial pathogens of the two species combined together. *Mycobacterium tuberculosis* (M.tb.) and *M. leprae* are important pathogens of humans. Tuberculosis (TB) and *M. avium* subspecies paratuberculosis (MAP) are the two most prevalent infections of humans and animals, respectively. One third of world's human population is estimated to be infected with M. tb., though only one tenth of infected persons develop clinical TB. *M. bovis* and MAP are important pathogens of livestock and infect wide range of wild animal species worldwide. *M. bovis* and MAP bear a zoonotic potential. Since MAP is not in-activated during pasteurization also has public health significance. Despite investing huge resources on diagnosis, control and management, the pathogens load has increased in intensity and prevalence. In developing countries 40 to 80% of AIDS patients are at risk of developing TB or Johne's disease (JD). Emergence of multi-drug resistant strains of M. tb., increased numbers of highly susceptible immuno-compromised individuals arising from AIDS pandemic. Extreme (XDR) or totally (TDR) drug resistant TB and leprosy, raises possibility of epidemic of mostly drug-resistant TB and leprosy. It would jeopardize the progress made in recent years to control tuberculosis globally. Patients with XDR or TDR will need treatment same way as tuberculosis patients before antibiotic era. Similarly, MAP is endemic in the livestock population of developed countries, where it has been investigated causing huge losses in animal production system. Author has experience of working in an institute (CIRG, Makhdoom), where JD was endemic in the goat herds of different breeds. Despite heavy culling of positive goats for last 30 years, incidence of disease has increased both in intensity and prevalence. Test and cull methodology used globally has not yielded desired results and was a misguided approach which led to loss of valuable germplasm. Therefore, we at CIRG, Makhdoom developed 'indigenous vaccine' using novel biotype ('Indian Bison Type) which has been therapeutic and preventive. Since then efficacy of the indigenous vaccine has been extensively evaluated in other goat herds, sheep flocks and herds of cattle and buffaloes of the country. Studies on involvement of MAP in different specific and non-specific chronic ailments of human population by our group, has shown strong positive correlation in cases of IBD, diabetes, etc. Medical fraternity in India refuses to accept MAP as human pathogen and simple pass on MAP, which like other NTMs. Another novel approach which has been used in India and other third world countries is practice of mixed farming like sheep and goat. It is high time to take stock of these four important Mycobacterial infections of both human beings and animal populations and develop similar therapeutic vaccine to control the menace of these almost incurable pathogens in cases of XDR and TDR TB and leprosy in human beings and against *M. bovis* (animal TB) in animals.

Biography

Shoor Vir Singh has completed his PhD at the age of 38 years from College of Veterinary Sciences in Mathura (UP), India. He has been awarded National Jawaharlal Nehru Award to ICAR for his Doctoral work. He has been working as Scientist (Veterinary Microbiologist) since 1984 in the Central Institute for Research on Goats, Makhdoom, Mathura, India and as Head of Animal Health Division since 2011 in the same institute. He has published more than 145 papers in reputed national and international journals and serving as editorial board member of reputed journals.

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