

Editorial

Bacterial immunostimulants in recurrent paediatric respiratory infections

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The defence mechanisms of the human body can be induced to provide immunity against bacteria by natural processes following infection or as a consequence of therapeutic and preventive medical intervention including vaccination, administration of immunoglobulins and therapy with immunostimulants derived from bacteria.

From the time of the 18th century when Edward Jenner first postulated the notion of prevention of disease by immunisation, many scientists have been striving tirelessly to produce vaccines against infective diseases that were known to cause considerable morbidity, mortality and in some cases, permanent disability. There are currently such vaccines against several bacterial and viral diseases. The fundamental principle is to induce the human immune system to produce special and specific immunity against a given infective agent. In that sense, each disease requires a specific vaccine.

Immunity is a multifaceted phenomenon and immunostimulation has been defined by various means but the exact meaning of the event defies accurate and specific delineation. It is perhaps better understood as the process of maintaining the immune system in a “state of alert” that is capable of efficiently handling microbial infections².

In recent years, the use of refined bacterial products to produce non-specific enhanced immunity has come to the fore. Two types of compounds that have been mostly studied are microbial ribosomal vaccines and bacterial lysates. Ribosomes are cell components that create proteins from amino acids. The DNA sequence in genes is copied into a messenger RNA and the ribosomes then read the information in this RNA and use it to create proteins³. Ribosomal vaccines have been assimilated from several different types of organisms and many of these preparations offer a higher degree of protection than do vaccines made from the homologous whole cells⁴. Bacterial lysates are mixtures of bacterial antigens derived from different inactivated pathogenic bacteria. They are of two types. One is polyvalent chemical bacterial lysates (PCBL) obtained by chemical lysis of the organisms and the other is polyvalent mechanical bacterial lysates (PMBL) created by

mechanical lysis of the microbes. PMBL are thought to be superior to PCBL as the use of chemicals in the latter tends to induce changes in the structure of proteins and hence alter their antigenicity.

Bacterial immunostimulants that contain either ribosomal extracts or bacterial lysates have been shown to induce a non-specific intensification of phagocytosis as well as orchestration of both cellular and humoral responses. The duality of their immunomodulatory activity mimics or attempts to repeat the immune response evoked by the intrusion of a pathogen into the human body, which is initially non-specific, but subsequently becomes specific¹.

Ribosomal vaccines have been shown to be effective in the prevention of recurrent ear, nose and throat infections in young children^{5,6} and paediatric recurrent lower respiratory tract infections^{7,8}. The preparation in use most commonly has the advantage that it is administered orally.

A considerable amount of work has also been done on PMBL. The earliest study was on its effectiveness in periodontitis⁹. Subsequently the efficacy has been demonstrated in respiratory infections¹⁰⁻¹⁴. PMBL too has the advantage that it is administered sublingually. More recently, encouraging animal experiments have suggested that PMBL may have a role to play in asthma too¹⁵. However, this needs to be confirmed in human studies.

It is an established fact that recurrent respiratory infections cause significant morbidity and disturbances to the quality of life in children. The bacterial immunostimulants are yet another modality of management that would help in alleviating the problems caused by these infections. Yet for all that, these should not be considered to be a “panacea for all ills” in recurrent paediatric respiratory diseases. Unfortunately, these immunostimulants are not available in the government hospitals in our country but some of them are available in the private sector.

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