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Short Communication

Impact of Probiotics in Respiratory Tract Infections

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DESCRIPTION

Probiotics are considered as "living micro-organisms", when taken effectively they can provide host significant nutritional benefits. Many probiotics, including *Lactobacillus spp.*, *Bifidobacterium spp.*, *Enterococcus spp.*, *Streptococcus spp.*, *Propionibacterium spp.*, *Bacillus cereus*, *Saccharomyces boulardii*, and various particular strains of *Escherichia coli*, have been demonstrated to have beneficial properties. The most popular probiotics are bacteria that belong to the genus *Lactobacillus*, which has more than 200 species. Due to its application in biotechnology, food, and medicine, *Lactobacillus spp.*, a gram-positive, facultative anaerobic bacteria that ferments carbohydrates to produce lactic acid. The gastrointestinal system, vaginal, oral cavity, respiratory tract, and skin of infected humans contain *Lactobacillus spp.* In the intestinal and vaginal tracts, they make up 6% and 95% including all bacteria [1].

It is generally recognised that *Lactobacilli*, which are natural immuno biotics, have significant immunomodulatory action and can treat gastrointestinal, oral, and vaginal problems. Recent data indicates that *Lactobacillus* can also influence respiratory immunity. Respiratory illnesses such as Respiratory Tract Infections (RTIs), asthma, lung cancer, Cystic Fibrosis (CF), and chronic obstructive pulmonary disease all improve from the administration of *Lactobacillus*. Another technique for treating respiratory disorders is to provide *Lactobacillus*. The mechanism involved in probiotic *Lactobacillus's* is therapeutic facilitating in respiratory health [2].

Role of probiotics

The world's major cause of mortality and incidence is RTI's. RTI's caused 4 million deaths annually over the world, despite the fact that many of them are moderate and identity. Worldwide, the influenza virus has infected 54.5 million people in 2017, affecting approximately 145,000 people. The SARS-CoV-2 virus is spreading severe acute respiratory syndrome all around the world. For many respiratory diseases, there are currently no viable vaccinations on the market, and the rise of drug-resistant bacteria makes it extremely difficult to treat RTIs effectively. Therefore, it's critical to develop a system that is both safe and effective for lowering the risk of RTIs. A range of RTIs, including bacterial and viral infections, have recently been overcome with the probiotic *Lactobacillus*. Symptoms produced on by poly (I:C) therapy may be alleviated by using *Lactobacillus* topically [3,4].

Numerous *Lactobacillus* species, such as *L. rhamnosus* GG, *L. casei Shirota*, *L. plantarum DK119*, *L. paracasei MCC1849*, *L. gasseri SBT2055*, *L. fermentum CJl-112*, *and L. kunkeei YB38*, can prevent against obtaining the influenza virus. Due to its safety and biotechnological benefit, *lactobacilli* also play a major role as a vaccine or adjuvant in preventing influenza virus infection. It is important to recognize that *L. johnsonii* oral supplementation in pregnant BALB/c mice can lower Th2 type cytokines and lung inflammation in newborn mice infected with Respiratory Syncytial Virus (RSV). Therefore, *lactobacillus* given to the mother may have a preventative impact for RTI's in the children [5].

The effects of therapy with live and inactivated strains of the same *Lactobacillus* bacteria (such as *L. rhamnosus* CRL1505) are often comparable, demonstrating that viability is not essential for *Lactobacillus* to have the beneficial immunoregulatory effect. However, mice can be completely protected against RSV infection when given nasally administered *L. rhamnosus* CRL1506 that is viable but not heat-killed. It demonstrates that *Lactobacilli* efficacy is strain-dependent. Therefore, it is essential to choose a *Lactobacillus* strain with strong immunomodulatory properties. However, *lactobacilli* can provide protection towards respiratory bacterial infections[6,7]. Animals became more resistant to *Streptococcus pneumoniae* infection, when *Lactobacilli* such *L. rhamnosus* CRL1505, *L. casei* CRL 431, and *L. pentosus* B240 are administered. *L. rhamnosus* CRL1505 intranasal inoculation is therapeutic in *S. pneumoniae*-infected immunodeficient mice. *L. rhamnosus* CRL1505 peptidoglycan produces a protective effect against *S. pneumoniae* infection that is comparable to that of the entire bacteria. Additionally, *L. rhamnosus* CRL1505 nasal treatment can decrease the pathogen load and lung damage in young mice with RSV infection and secondary *S. pneumoniae* infection.

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CONCLUSION

Lactobacillus is a gram-positive, facultative anaerobic bacterium that ferments carbohydrates to produce lactic acid. Respiratory illnesses such as Respiratory Tract Infections (RTI's), asthma, lung cancer, cystic fibrosis, and chronic obstructive pulmonary disease all improve from the administration of probiotics. Oral supplementation in pregnant BALB/c mice can lower Th2 type cytokines and lung inflammation in new born mice infected with Respiratory Syncytial Virus (RSV).

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