Use of LAB to Control Urogenital Infections

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Introduction

A urinary tract infection (UTI) is an infection that affects part of the urinary tract. When it affects the lower urinary tract, it is known as pyelonephritis (a kidney infection). The indigenous microbiota plays an important role in protecting the host from colonization of invading pathogens. Lactobacillus is the predominant genus in the vaginal [1] and endocervical microbial communities [2] and is present at concentrations of 107 to 108 CFU/ml of vaginal fluid in healthy postmenopausal/ premenopausal women [3].

There is an emerging role of lactobacilli in the control and maintenance of the vaginal bacterial microflora. L. jensenii and L. gasseri are two of the most common species present, as determined by culture-independent techniques [4]. Relationship between LAB and vaginal pathogen have been studied which indicates that antibiotic treatment should not kill healthy LAB to preserve healthy vagina [4]. Earlier, Raiz and others (2010) isolated 72 strains from yogurt and fecal materials of human, chick, parrot and cat. Only two isolates namely L. fermentum and L. acidophilus were found to produce bacteriocins having antimicrobial potential against cephalosporin resistant E. coli. In a clinical trial performed using capsules containing L. fermentum RC-14 and L. rhamnosus GR-1, Gil et al. (2010) have proven their effectiveness for the treatment of patients with vulvovaginal candidiasis. Recently, L. fermentum was isolated from human milk and its bacteriocin has been assessed for preventing urinary tract infections [18-23]. Probiotics recommended for eradication of common human UTI vaginal pathogens are enlisted in Table A [24-26].

<table>
<thead>
<tr>
<th>Causal Organism</th>
<th>Disease</th>
<th>Symptoms</th>
<th>Recommended Probiotics</th>
<th>References</th>
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<tbody>
<tr>
<td>Candida albicans</td>
<td>Vaginitis, Vulvovaginal candidiasis</td>
<td>Irritation and soreness of the vulva, a thick, white vaginal discharge that doesn't usually smell.</td>
<td>L. pentosus TV35b</td>
<td>[19]</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>UTI</td>
<td>Blood in urine, pyelonephritis</td>
<td>L. salivarius subsp. salivarius CRL 1328</td>
<td>[10]</td>
</tr>
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<td>Enterococcus faecium</td>
<td>UTI</td>
<td>Normal commensals in human vagina, but if exceeds in counts can cause disease.</td>
<td>L. salivarius subsp. salivarius CRL 1328</td>
<td>[11]</td>
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<td>Escherichia Coli</td>
<td>UTI cystitis</td>
<td>Pain or burning with urination, lower abdominal pain or pressure, and/or the need to urinate frequently; cloudy darker or bloody urine</td>
<td>L. acidophilus CRL 1259, L. crispatus 21L07</td>
<td>[24,25]</td>
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<td>L. jensenii 5L08</td>
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Klebsiella pneumonia  UTI  Burning sensation during urination, back pain, abdominal pain  L. salivarius subsp. salivarius CRL 1326  [21]

Neisseria gonorrhoeae  Gonorrhea  Vaginal discharge and pain during urination, urethritis  L. salivarius subsp. salivarius CRL 1326  [10,11]

Pseudomonas aeruginosa  Burning sensation during urination, back pain, abdominal pain  Hospital-acquired urinary tract infections from catheterization, instrumentation or surgery  L. gasseri TL093C, L. acidophilus TL099,  L. delbrueckii TL059  [15]

Staphylococcus aureus  Toxic shock syndrome  Variety of local and systemic infections  L. bulgaricus  [14]

Streptococcus agalactiae  UTI  Bacteria can be passed from a pregnant woman to her baby during labor, if she is a carrier of the bacteria.  L. bulgaricus  [24,25]

Table A: Common Opportunistic Pathogens of Human Urogenital System and their control by probiotic LAB.

References

