Candida

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Dietary supplement of neosugar alters the fecal flora and decreases activities of some reductive enzymes in human subjects.

Buddington RK; Williams CH; Chen SC; Witherly SA Department of Biological Sciences, Mississippi State University, Mississippi State 39762-5759, USA.

Am J Clin Nutr (United States) May 1996, 63 (5) p709-16

The influence of dietary fructooligosaccharide (neosugar) on the fecal flora and activities of reductive enzymes was studied in 12 healthy, adult human subjects fed a controlled diet for 42 d and given 4 g neosugar/d between days 7 and 32. Fecal samples were collected before, during, and after supplementation with neosugar to enumerate total anaerobes, aerobes, bifidobacteria, and enterobacteria, and to assay for beta-glucuronidase, nitroreductase, and glycocholic acid hydroxylase. Although the controlled diet caused an increase in total anaerobes and bifidobacteria, the highest densities occurred during supplementation with neosugar. Total aerobes and enterobacteria were less affected by diet and neosugar. Neosugar caused beta-glucuronidase and glycocholic acid hydroxylase activities to decrease 75% and 90%, respectively; both increased after supplementation with neosugar was stopped. Nitroreductase activity declined 80% after the control diet was started, but was not affected by neosugar. These findings indicate that 4 g neosugar alters the fecal flora in a manner perceived as beneficial by decreasing activities of some reductive enzymes.

Inhibition of Candida albicans by Lactobacillus acidophilus.

Collins EB; Hardt P

J Dairy Sci (United States) May 1980, 63 (5) p830-2

Candida albicans grew at pH 4.6 or above in nutrient broth containing 5% glucose but was retarded at pH 7.7 by filtrates of Lactobacillus acidophilus grown in casitone broth. Vaginal implantation of nonfermented acidophilus milk, yogurt, or low-fat milk for preventing recurrence of monilia vaginitis subsequent to treatment with Nystatin was studied with 30 women. Reinfections within 3 mo according to product received were: no milk product, 3; yogurt, 1; nonfermented acidophilus milk, 1; and low-fat milk, 0.

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New York: Professional Books.

The Yeast Connection Handbook 1999.

Crook, W.G.

New York: Professional Books.

"Garlic: A Review of Its Relationship to Malignant Disease"

Dausch Judith G., Ph.D., RD and Nixon, Daniel W., M.D.

Preventive Medicine, May 1990;19(3):346-361

This review states that Kyolic garlic extract enhanced the elimination of candida albicans in infected animals. Kyolic can inhibit aflatoxin or benzopyrene induced mutagenesis. It can also inhibit aflatoxin from binding to DNA. Garlic reduces the formation of organosoluble metabolites and increases the formation of water soluble metabolites facilitating elimination of the carcinogen.

[A trial of the use of diflucan (fluconazole) in patients with vaginal candidiasis]

Dmitrieva NV, Sokolova EN, Makhova EE, Petukhova IN

Antibiot Khimioter 1993 Dec;38(12):39-41

Fifty females with vaginitis due to Candida albicans were treated with fluconazol (diflucan) in a single dose of 150 mg administered per os. A complete elimination of the clinical signs in 42 out of 50 patients (84 per cent) and a significant improvement of the clinical picture in 4 out of 50 patients (8 per cent) were recorded. The cultures of the smears produced no fungal growth with respect to 31 out of 36 patients (86.1 per cent), while microscopically the presence of the fungus with the signs of pathomorphosis was detected. Such cells could be a source of the fungal reinfection. Therefore, diflucan proved to be a highly efficient drug in the treatment of vaginal candidiasis and might be considered as an additional agent for the therapy of the disease.

Biotherapeutic agents. A neglected modality for the treatment and prevention of selected intestinal and vaginal infections

Elmer GW; Surawicz CM; McFarland LV Department of Medicinal Chemistry, School of Pharmacy, University of Washington, Seattle 98195, USA.

JAMA (United States) Mar 20 1996, 275 (11) p870-6

OBJECTIVE: To evaluate the potential of biotherapeutic agents (microorganisms with therapeutic properties) for the prevention and/or treatment of selected intestinal and vaginal infections.

DATA SOURCES: The MEDLINE database was searched for all relevant articles published between 1966 and September 1995. Search terms used were biotherapeutic agent, probiotic, Lactobacillus, Saccharomyces, Bifidobacterium, Candida, gastrointestinal-system, vaginitis, vaginosis-bacterial, and related terms. The bibliographies of obtained articles were also reviewed.

STUDY SELECTION AND DATA EXTRACTION: All placebo-controlled human studies on biotherapeutic agents were reviewed. English-language open trials, case series and reports, and animal studies were reviewed only if they were especially relevant to providing information on the potential efficacy, adverse effects, or mechanisms of action of these agents.

DATA SYNTHESIS: Placebo-controlled studies have shown that biotherapeutic agents have been used successfully to prevent antibiotic-associated diarrhea (Lactobacillus caseiGG, bifidobacterium longum, B longum with L acidophilus, and Saccharomyces boulardii), to prevent acute infantile diarrhea (Bifidobacterium bifidum with Streptococcus thermophilus), to treat recurrent Clostridium difficile disease (S boulardii), and to treat various other diarrheal illnesses (Enterococcus faecium SF68, L caseiGG, and S boulardii). There is also evidence for Lactobacillus acidophilus in the prevention of candidal vaginitis. Few adverse effects have been reported. However, many of the studies tested only small numbers of patients or volunteers.

CONCLUSIONS: There is now evidence that administration of selected microorganisms is beneficial in the prevention and treatment of certain intestinal and, possibly, treatment of vaginal infections. In an effort to decrease the reliance on antimicrobials, the time has come to carefully explore the therapeutic applications of biotherapeutic agents.

Antimicrobial activity of essential oils and other plant extracts.

Hammer KA, Carson CF, Riley TV. Department of Microbiology, The University of Western Australia, Nedlands, Western Australia. khammer@cyllene.uwa.edu.au

J Appl Microbiol 1999 Jun;86(6):985-90

The antimicrobial activity of plant oils and extracts has been recognized for many years. However, few investigations have compared large numbers of oils and extracts using methods that are directly comparable. In the present study, 52 plant oils and extracts were investigated for activity against Acinetobacter baumanii, Aeromonas veronii biogroup sobria, Candida albicans, Enterococcus

faecalis, Escherichia col, Klebsiella pneumoniae, Pseudomonas aeruginosa, Salmonella enterica subsp. enterica serotype typhimurium, Serratia marcescens and Staphylococcus aureus, using an agar dilution method. Lemongrass, oregano and bay inhibited all organisms at concentrations of < or = 2.0% (v/v). Six oils did not inhibit any organisms at the highest concentration, which was 2.0% (v/v) oil for apricot kernel, evening primrose, acadamia, pumpkin, sage and sweet almond. Variable activity was recorded for the remaining oils. Twenty of the plant oils and extracts were investigated, using a broth microdilution method, for activity against C. albicans, Staph. aureus and E. coli. The lowest minimum inhibitory concentrations were 0.03% (v/v) thyme oil against C. albicans and E. coli and 0.008% (v/v) vetiver oil against Staph. aureus. These results support the notion that plant essential oils and extracts may have a role as pharmaceuticals and preservatives.

In vitro susceptibility of Malassezia furfur to the essential oil of Melaleuca alternifolia.

Hammer KA; Carson CF; Riley TV Department of Microbiology, University of Western Australia, Nedlands. khammer@cyllene.uwa.edu.au

J Med Vet Mycol (ENGLAND) Sep-Oct 1997, 35 (5) p375-7,

The susceptibility of 64 Malassezia furfur isolates to Melaleuca alternifolia oil was determined. The minimum inhibitory concentration for 90% of isolates was 0.25% by agar dilution and 0.12% by broth dilution. These data indicate that tea tree oil may be useful in the treatment of skin conditions involving M. furfur.

Ingestion of yogurt containing Lactobacillus acidophilus as prophylaxis for candidal vaginitis

Hilton E; Isenberg HD; Alperstein P; France K; Borenstein MT Division of Infectious Diseases, Long Island Jewish Medical Center, New Hyde Park, NY 11042.

Ann Intern Med (United States) Mar 1 1992, 116 (5) p353-7

OBJECTIVE: To assess whether daily ingestion of yogurt containing Lactobacillus acidophilus prevents vulvovaginal candidal infections.

DESIGN: Crossover trial for at least 1 year during which patients were examined for candidal infections and colonizations while receiving either a yogurt-free or a yogurt-containing diet. Patients served as their own controls.

SETTING: Ambulatory infectious disease center in a teaching hospital providing tertiary care.

PATIENTS: Thirty-three women with recurrent candidal vaginitis were eligible after recruitment from community practices and clinics and through advertising. Twelve patients were eliminated for protocol violations. Of the remaining 21 patients, 8 who were assigned to the yogurt arm initially refused to enter the control phase 6 months later. Thus, 13 patients completed the protocol.

INTERVENTIONS: Women ate yogurt for 6 months of the study period.

MEASUREMENTS: Colonization of lactobacilli and candida in the vagina and rectum; candidal infections of the vagina.

MAIN RESULTS: Thirty-three eligible patients were studied. A threefold decrease in infections was seen when patients consumed yogurt containing Lactobacillus acidophilus. The mean (+/- SD) number of infections per 6 months was 2.54 +/- 1.66 in the control arm and 0.38 +/- 0.51 per 6 months in the yogurt arm (P = 0.001). Candidal colonization decreased from a mean of 3.23 +/- 2.17 per 6 months in the control arm to 0.84 +/- 0.90 per 6 months in the yogurt arm (P = 0.001).

CONCLUSION: Daily ingestion of 8 ounces of yogurt containing Lactobacillus acidophilus decreased both candidal colonization and infection.

Dietary fructooligosaccharide, xylooligosaccharide and gum arabic have variable effects on cecal and colonic microbiota and epithelial cell proliferation in mice and rats.

Howard MD; Gordon DT; Garleb KA; Kerley MS Department of Animal Science, University of Missouri, Columbia 65211, USA.

J Nutr (United States) Oct 1995, 125 (10) p2604-9

Two experiments were conducted to determine if supplementing soluble fiber (fructooligosaccharide, xylooligosaccharide or gum arabic) to a semi-elemental diet would beneficially change cecal and colonic microbiota populations and enhance epithelial cell

proliferation. Experiments 1 and 2 used identical dietary regimens; mice and rats were given free access to a powdered semi-elemental diet. Animals were assigned to one of the four following treatment groups: control, no supplemental dietary fiber, fructooligosaccharide, xylooligosaccharide and gum arabic. Dietary fiber was supplied via drinking water at 30 g/L. In Experiment 1 populations of Bifidobacteria and total anaerobic flora were enumerated from the contents of the cecum and colon of weanling mice. Consumption of fructooligosaccharide increased (< 0.05) the concentrations of Bifidobacteria and the ratio of Bifidobacteria to total anaerobic flora. In Experiment 2 tissue from the cecum and distal colon of weanling rats was examined for morphological changes of the mucosa. Consumption of xylooligosaccharide increased (< 0.05) cecal crypt depth and labeling index relative to the other three treatments. Consumption of gum arabic and the control diet increased (< 0.01) cecal proliferation zone. Consumption of xylooligosaccharide and the control diet increased (< 0.01) cecal cell density (number of cells in a vertical-half of the crypt). Distal colonic crypt depth was greatest (< 0.05) in controls and rats fed fructooligosaccharide, intermediate in those fed gum arabic, and smallest in those fed xylooligosaccharide. These results suggest that fructooligosaccharide effectively stimulates growth of Bifidobacteria and xylooligosaccharide supports a modest enhancement of cecal epithelial cell proliferation.

Evidence for the involvement of thiocyanate in the inhibition of Candida albicans by Lactobacillus acidophilus.

Jack M; Wood BJ; Berry DR Department of Bioscience and Biotechnology, University of Strathclyde, Glasgow, Scotland, Great Britain.

Microbios (England) 1990, 62 (250) p37-46

Lactobacillus acidophilus has been found to inhibit Candida albicans when grown on MRS agar plates. Attempts to isolate an active factor responsible for this inhibition from liquid culture and agar plates were not successful. The addition of sodium thiocyanate to the agar was found to increase the inhibition offered by the lactobacillus. The results indicate that hydrogen peroxide produced by the lactobacillus is being used to convert the thiocyanate to hypothiocyanate which is more toxic. The involvement of a lactobacillus peroxidase in this conversion is postulated

Design and fungicidal activity of mucoadhesive lactoferrin tablets for the treatment of oropharyngeal candidosis.

Kuipers ME, Heegsma J, Bakker HI, Meijer DK, Swart PJ, Frijlink EW, Eissens AC, de Vries-Hospers HG, van den Berg JJ. Department of Pharmacokinetics and Drug Delivery, University of Groningen, Groningen, The Netherlands.

Drug Deliv 2002 Jan-Mar;9(1):31-8

Lactoferrin (Lf) is a potential drug candidate for the treatment of oropharyngeal Candida infections. However, for an effective therapeutic treatment an appropriate dosage form is required. Therefore a mucoadhesive tablet for buccal application was developed. Tablets of sufficient strength could be produced on high speed tabletting machines, but they could only be obtained when the protein contained at least 7% moisture. The tablet contained sodium alginate both for its release-controlling properties as well as for its mucoadhesive properties. Furthermore, phosphate buffer was added to keep the pH of the saliva in the mouth within the range of 6.5 to 7.5. In this pH range, Lf has shown to have its highest activity against Candida growth inhibition. The tablet formulation containing Lf had the same antifungal properties as compared with Lf alone, because in most cases identical inhibitory concentrations were observed against several clinical isolates of Candida albicans and Candida glabrata. In human volunteers the tablets, containing 250 mg Lf and placed in each pouch, were able to keep the Lf concentration in the saliva at effective levels for at least 2 hr, while the pH of the saliva remained within the desired range. We concluded that the developed mucoadhesive tablet can improve the therapeutic efficacy of Lf and that it is suitable for further clinical research.

Direct evidence of the generation in human stomach of an antimicrobial peptide domain (lactoferricin) from ingested lactoferrin.

Kuwata H, Yip TT, Tomita M, Hutchens TW. Department of Food Science and Technology, University of California, Davis 95616, USA. hidi@msn.com

Biochim Biophys Acta 1998 Dec 8;1429(1):129-41

The ability to define specific alterations in the structure and function of proteins as they are introduced and processed in vivo remains an important goal. We have evaluated the generation, in vivo, of an antimicrobial peptide (lactoferricin) derived from ingested bovine lactoferrin by surface-enhanced laser desorption/ionization (SELDI). SELDI was used in the affinity mass spectrometry operational mode to detect and quantify lactoferricin directly from unfractionated gastric contents using a chemically defined ligand with a terminal n-butyl group as the lactoferricin affinity capture device. By this method, we were able to detect and quantify lactoferricin directly upon examination of unfractionated gastric contents recovered from an adult subject 10 min after ingestion of bovine lactoferrin (200 ml of 10 mg/ml (1.2 x 10(-4) mol/l) solution). Lactoferricin produced in vivo was directly captured by a surface-enhanced affinity capture (SEAC) device composed of molecules with a terminal n-butyl group and analyzed by laser desorption/ionization time-of-flight mass spectrometry. The recovery of standard lactoferricin or lactoferrin added to an aliquot of the

gastric contents was determined to be nearly 100%, confirming the efficiency of this method. The amount of lactoferricin detected in the gastric contents was 16.9+/-2.7 microg/ml (5.4+/-0.8 x 10(-6) mol/l). However, a large proportion of ingested lactoferrin was found to be incompletely hydrolyzed. Lactoferrin fragments containing the lactoferricin region were analyzed by in situ pepsin hydrolysis after being captured on the SEAC device. Partially degraded lactoferrin fragments containing the lactoferricin region, including fragments corresponding to positions 17-43, 17-44, 12-44, 9-58 and 16-79 of the bovine lactoferrin sequence, were found to be present at concentrations as high as 5.7+/-0.7 x 10(-5) mol/l. These results suggest that significant amounts of bovine lactoferricin would be produced in the human stomach following ingestion of food, such as infant formula, supplemented with bovine lactoferrin. We propose that physiologically functional quantities of human lactoferricin could be generated in the stomach of breast-fed infants, and possibly, in the case of adults, from lactoferrin secreted into saliva.

In vitro fructooligosaccharide utilization and inhibition of Salmonella spp. by selected bacteria.

Oyarzabal OA; Conner DE Department of Poultry Science, Auburn University, Alabama 36849-5416, USA.

Poult Sci (United States) Sep 1995, 74 (9) p1418-25

In vitro experiments were conducted to determine: 1) inhibitory capacities of potential direct-fed microbial bacteria against Salmonella serotypes; and 2) the ability of Bifidobacterium bifidum, Enterococcus faecium, Lactobacillus casei, Lactococcus lactis, Pediococcus sp., and Salmonella spp. to grow in media containing fructooligosaccharides (FOS-50 or FOS pure formulation) as the only carbohydrate source. Thirteen bacteria (two strains of Bacillus coagulans, Bacillus licheniformis, Bacillus subtilis, B. bifidum, E. faecium, two strains of Lactobacillus acidophilus, L. casei, Pediococcus sp., Propionibacterium acidopropionici, P. jensenii, and Propionibacterium sp.) were tested for inhibition of six Salmonella serotypes (S. california, S. enteritidis, S. heidelberg, S. mission, S. senftenberg, and S. typhimurium) using a spot-the-lawn technique. Bifidobacterium bifidum, E. faecium, all lactobacilli, and Pediococcus sp. clearly inhibited growth of all Salmonella serotypes. In the growth experiments, E. faecium, L. lactis, and Pediococcus sp. grew in media with either FOS-50 or the pure formulation of FOS as the sole carbohydrate source. All tested Salmonella serotypes utilized FOS-50 for growth; however growth varied among the serotypes. In contrast, none of the Salmonella serotypes grew in media containing the pure formulation of FOS as the only carbohydrate source.

Intestinal health.

Percival, M.

Clin. Nutr. Insights 1997; 5(5): 1-6.

The future of medicine: The effect of tea tree oil extract on the growth of fungi

Rushton R.T.; Davis N.W.; Page J.C.; Durkin C.A. R.T. Rushton, 1210 Scott Street, San Francisco, CA 94115 United States Lower Extremity (United States), 1997, 4/2 (113-116)

Mycoses of the foot are among the most common pedal problems encountered in podiatric medicine. Melaleuca alternifolia (tea tree) oil has a long history of antiseptic use for dermatologic conditions, including fungal infections, which is largely based on anecdotal evidence. In an in vitro study of the antifungal properties of tea tree oil, the extract proved to have an inhibitory effect on the growth of 10 clinically important fungi.

Ingestion of yogurt containing Lactobacillus acidophilus compared with pasteurized yogurt as prophylaxis for recurrent candidal vaginitis and bacterial vaginosis.

Shalev E; Battino S; Weiner E; Colodner R; Keness Y Department of Obstetrics and Gynaecology, Central Emek Hospital, Afula, Israel.

Arch Fam Med (United States) Nov-Dec 1996, 5 (10) p593-6

To compare and assess ingestion of yogurt that contained live Lactobacillus acidophilus with pasteurized yogurt as prophylaxis for recurrent bacterial vaginosis (BV) and candidal vaginitis, we designed a crossover trial during which patients were examined monthly for candidal infection and BV while they were receiving either a pasteurized yogurt or a yogurt that contained live L acidophilus. Forty-six patients in 2 groups of 23 were randomly assigned to each of the study groups. At least 28 (61%) participated during the first 4 months of the study. Seven patients completed the entire study protocol. We concluded that daily ingestion of 150 mL of yogurt, enriched with live L acidophilus, was associated with an increased prevalence of colonization of the rectum and vagina by the bacteria, and this ingestion of yogurt may have reduced episodes of BV.

A comparison of susceptibility to five antifungal agents of yeast cultures from burn patients.

Still JM Jr; Law EJ; Belcher KE; Spencer SA Augusta Regional Medical Center, Georgia, USA.

Burns (England) May 1995, 21 (3) p167-70

Patients with significant degrees of immunocompromise, such as cancer, AIDS and large burns, who have received significant amounts of antibiotics, may develop infections with yeast organisms. Over a 3-year period, all patients with positive fungal blood cultures and most wounds of patients with large burns considered to be a risk of yeast infection were selected and tested for their susceptibility to five antifungal agents, amphotericin B, ketoconazole, miconazole, diflucan, and 5-fluorocytosine. In all, 244 specimens of yeast were tested: 142 Candida albicans, 52 Candida parapsilosis, 26 Candida tropicalis and 13 Trichosporon beigelii. A limited number of other isolates of Candida (12) were also encountered. All Candida organism were sensitive to amphotericin B. There was wide variation in regard to the susceptibility to the other four agents, with C. albicans and C. tropicalis being largely resistant to miconazole and ketoconazole. T. beigelii was recovered in 13 patients. One-half of these organisms was resistant to amphotericin B. Awareness of variations in species and susceptibility are helpful in the selection of appropriate therapeutic antifungal agents.

Effect of Lactobacillus acidophilus on antibiotic-associated gastrointestinal morbidity: a prospective randomized trial.

Witsell DL; Garrett CG; Yarbrough WG; Dorrestein SP; Drake AF; Weissler MC Vanderbilt Voice and Balance Center, Vanderbilt University, Nashville, Tennessee, USA.

J Otolaryngol (Canada) Aug 1995, 24 (4) p230-3

Oral antibiotic therapy can alter the gastrointestinal microflora and result in troublesome gastrointestinal complaints. Patients who have experience with broad-spectrum antibiotics may be reluctant to start or to comply with antibiotic therapy due to the associated discomfort. In the field of otolaryngology, oral antibiotic therapy is commonplace, and patient intolerance of a particular antibiotic may result in compromise to a less effective choice. Yogurt, which contains Lactobacillus acidophilus, is often recommended by practitioners to help reduce the side effects of oral antibiotic therapy. We wanted to objectively evaluate the effect of orally administered L. acidophilus on the gastrointestinal side effects of oral broad-spectrum antibiotic therapy. Twenty-seven outpatients, 10 years of age or older, with ear, sinus, or throat infections, in whom amoxicillin/clavulanate was felt to be the antibiotic of choice, were randomly assigned to amoxicillin/clavulanate only, or amoxicillin/clavulanate and Lactobacillus treatment groups. Each patient was advised by the nursing staff to consume a well-balanced diet, and a detailed explanation of the medication schedule was given. A questionnaire was given to each patient at the conclusion of therapy. The data were analyzed using Spearman's rank-order correlations. Concomitant therapy of L. acidophilus with amoxicillin/clavulanate was associated with a significant decrease in patient complaints of gastrointestinal side effects and yeast superinfection. Almost all patients (89%) reported resolution of infection during the course of therapy. We believe that use of L. acidophilus is warranted in patients on broad-spectrum antibiotic therapy with gastrointestinal complaints.

Vitamin C inhibits arylamine N-acetyltransferase activity in the fungus Candida albicans

Wu L.-T.; Chung J.-G.; Tsou M.-F.; Ho H.-C.; Chang S.-H. L.-T. Wu, Department of Microbiology, China Medical College, Taichung Taiwan Research Communications in Pharmacology and Toxicology (United States), 1998, 3/1-2 (45-54)

Drug Deliv 2002 Jan-Mar;9(1):31-8

N-acetyltransferase activities were determined in Candida albicans which is a member of the normal flora of the mucous membranes in the respiratory, gastrointestinal, and female genital tracts. The N-acetylation of 2- aminofluorene by the N-acetyltransferase (NAT) from Candida albicans was determined using high pressure liquid chromatography. Cytosols or suspensions of C. albicans with and without selected concentrations of vitamin C co- treatment showed different percentages of 2-aminofluorene acetylation. The data indicate that there was lower NAT activity associated with increased vitamin C in C. albicans cytosols (IC50 values was 15 mM) and intact cells (IC50 value was 20 mM). In the cytosol and intact fungal studies, the apparent values of Km and Vmax were decreased after co-treatment with 10 mM vitamin C . This report is the first demonstration of vitamin C inhibiting arylamine NAT activity in the fungus C. ablicans.

SUGGESTED READING

Thrush bowel infection: existence, incidence, prevention and treatment, particularly by a Lactobacillus acidophilus preparation.

Alexander JG Curr Med Drugs (England) Dec 1967, 8 (4) p3-11

No abstract.

Vitamin C and cervico-vaginal infections in pregnant women

Casanueva E.; Reyes L.; Luna A.; Tejero E.; Pfeffer F.; Meza C. E. Casanueva, Instituto Nacional de Perinatologia, Montes Urales 800, Mexico DF CP 11000 Mexico

Nutrition Research (United States), 1998, 18/6 (939-944)

There are many studies that show an association between infections and vitamin C status but they lack a biochemical evaluation of the basal conditions of this nutrient before the infection, so the objective of this study was to evaluate the effect of cervico-vaginal infections on plasma and leukocyte vitamin C levels in pregnant women. A case-control study was performed where leukocyte counts, vitamin C plasma and leukocyte levels and the presence of cervico-vaginal infections were evaluated in women throughout their pregnancy. Infections were caused mainly by Candida albicans and Gardnerella vaginalis. In women where a cervico-vaginal infection was detected there was an increase in leukocyte counts and a decrease in leukocyte vitamin C levels, no difference was found in plasma levels. When the infected women were compared with the non-infected the only difference found was in the vitamin C leukocyte levels during the infectious process. By these means we concluded that cervico-vaginal infection do not affect plasma vitamin C levels and that in the presence of infection vitamin C leukocyte levels are not representativeof the body store of this vitamin.

Tea tree oil causes K+ leakage and inhibits respiration in Escherichia coli.

Cox SD; Gustafson JE; Mann CM; Markham JL; Liew YC; Hartland RP; Bell HC; Warmington JR; Wyllie SG Centre for Biostructural and Biomolecular Research, University of Western Sydney, Hawkesbury, New South Wales, Australia.

Lett Appl Microbiol (England) May 1998, 26 (5) p355-8

Concentrations of tea tree oil (TTO) which inhibit or decrease growth of Escherichia coli also inhibit glucose-dependent respiration and stimulate the leakage of intracellular K+. Stationary phase cells are more tolerant to these TTO effects than exponential phase cells.

[Fluconazole--a new antifungal agent]

Dobloug JH Infeksjonsmedisinsk avdeling, Ulleval sykehus, Oslo.

Tidsskr Nor Laegeforen 1992 Jun 10;112(15):1961-3

Fluconazole (Diflucan) is a new triazole antifungal agent that is effective against a wide range of fungi and has a favourable pharmacokinetic profile. Fluconazole is absorbed well after oral intake independent of food intake. Fluconazole is given once daily, in a dose of 50-400 mg. The dosage is the same for oral and parenteral administration. Tissue penetration is good, as is the concentration in cerebrospinal fluid. Fluconazole should not be given to children under 16 years of age, nor to pregnant or breast-feeding women. In Norway, fluconazole is indicated for treatment of candida vaginitis that is resistant to other treatment, invasive candida infection, candida stomatitis in immunocompromised hosts, and cryptococcalmeningitis.

"Perspective Evaluation of Candida Antigen Detection Test For Invasive Candidiasis and Immunocompromised Adult Patients With Cancer"

Escuro, Ruben S., M.D., et al

The American Journal of Medicine, December 1989;87(621-627)

No abstract.

Inhibition of Candida albicans by Lactobacillus acidophilus: evidence for the involvement of a peroxidase system.

Fitzsimmons N; Berry DR Microbiology Laboratory, Crosshouse Hospital, Kilmarnock, Scotland.

Microbios (England) 1994, 80 (323) p125-33

A range of cultures of Lactobacillus acidophilus was isolated from patients using oral, vaginal and endocervical swabs. These were

investigated for their ability to:

(1) inhibit the growth of Candida albicans, and

(2) generate peroxidase, hydrogen peroxide and hypothiocyanite. Inhibition of Candida albicans and hydrogen peroxide production was detected in nine out of twelve strains whereas peroxidase production was only detected in three out of twelve strains, all from oral swabs. Hypothiocyanite production was detected in two strains and it was only detected in these strains after growth in MRS medium in aerobic conditions.

Viricidal effects of Lactobacillus and yeast fermentation.

Gilbert JP; Wooley RE; Shotts EB Jr; Dickens JA Appl Environ Microbiol (United States) Aug 1983, 46 (2) p452-8

No abstract.

Effects of tea tree oil on Escherichia coli.

Gustafson JE; Liew YC; Chew S; Markham J; Bell HC; Wyllie SG; Warmington JR Microbiology Group, School of Biomedical Sciences, Curtin University of Technology, Perth, Western Australia. tgustafs@alpha2.curtin.edu.au

Lett Appl Microbiol (England) Mar 1998, 26 (3) p194-8,

Tea tree oil (TTO) stimulates autolysis in exponential and stationary phase cells of Escherichia coli. Electron micrographs of cells grown in the presence of TTO showed the loss of electron dense material, coagulation of cell cytoplasm and formation of extracellular blebs. Stationary phase cells demonstrated less TTO-stimulated autolysis and also had greater tolerance to TTO-induced cell death, compared to exponentially grown cells. It was also revealed that subpopulation of stationary phase cells demonstrated increased tolerance to TTO-bactericidal effects.

In-vitro activity of essential oils, in particular Melaleuca alternifolia (tea tree) oil and tea tree oil products, against Candida spp.

Hammer K.A.; Carson C.F.; Riley T.V. K.A. Hammer, Department of Microbiology, The University of Western Australia, Queen Elizabeth II Medical Centre, Nedlands, WA 6009 Australia

Journal of Antimicrobial Chemotherapy (United Kingdom), 1998, 42/5 (591-595)

The in-vitro activity of a range of essential oils, including tea tree oil, against the yeast candida was examined. Of the 24 essential oils tested by the agar dilution method against Candida albicans ATCC 10231, three did not inhibit C. albicans at the highest concentration tested, which was 2.0% (v/v) oil. Sandalwood oil had the lowest MIC, inhibiting C. albicans at 0.06%. Melaleuca alternifolia (tea tree) oil was investigated for activity against 81 C. albicans isolates and 33 non-albicans Candida isolates. By the broth microdilution method, the minimum concentration of oil inhibiting 90% of isolates for both C. albicans and non-albicans Candida species was 0.25% (v/v). The minimum concentration of oil killing 90% of isolates was 0.25% for C. albicans and 0.5% for non-albicans Candida species. Fifty-seven Candida isolates were tested for sensitivity to tea tree oil by the agar dilution method; the minimum concentration of oil inhibiting 90% of isolates was 0.5%. Tests on three intra-vaginal tea tree oil products showed these products to have MICs and minimum fungicidal concentrations comparable to those of non-formulated tea tree oil, indicating that the tea tree oil contained in these products has retained its anticandidal activity. These data indicate that some essential oils are active against Candida spp., suggesting that they may be useful in the topical treatment of superficial candida infections.

Lactoferricin, a new antimicrobial peptide.

Jones EM, Smart A, Bloomberg G, Burgess L, Millar MR. Department of Microbiology, Bristol Royal Infirmary, UK.

J Appl Bacteriol 1994 Aug;77(2):208-14

Lactoferricin B (LF-B) is a peptide derived from acid-pepsin digestion of bovine lactoferrin, which has antimicrobial properties. In order to assess the antimicrobial spectrum of LF-B and its possible in vivo uses, the minimum inhibitory and microbicidal concentrations of pure lactoferricin B were determined for a range of bacterial species and under varying conditions of growth including growth phase and size of the inoculum, pH and ionic strength of the medium. Lactoferricin B was bactericidal against a wide range of bacteria and Candida albicans. Proteus spp., Pseudomonas cepacia and Serratia spp. were resistant. The bactericidal activity of LF-B was inhibited by increasing ionic strength and bacterial inoculum and at acid pH. The activity of lactoferricin B was completely inhibited by the addition of 5% whole cow's milk and was reduced in the presence of increasing

concentrations of mucin. These results indicate the potential of LF-B to reduce the numbers of organisms in a simple medium, but raise doubts about its role in vivo because of its sensitivity to changes in physical variables. It may be that lactoferricin exerts a transient antimicrobial effect at mucosal surfaces.

"Regulation of The Immune Response to Candida Albicans by Monocyte and Progesterone"

Kalo-Klein, Aliza, Ph.D. and Witkin, Steven S. American Journal of Obstetrics and Gynecology, 1991;164:1351-4

No abstract.

[Fecal microflora in healthy young people]

Kostiukovskaia ON; Gladkaia EA; Eliseeva EA; Kanivets IA; Kabanov AN Zh Mikrobiol Epidemiol Immunobiol (USSR) Feb 1983, (2) p36-40

The study of the intestinal microflora in 119 young adults was carried out. A high content of anaerobic representatives of the intestinal microflora (bifido- and lactobacteria) and extremely wide fluctuations in the number of E. coli (1-5 million to 700-800 million cells per g of feces) were shown. The species composition of the facultative group was found to be variegated. Staphylococci, yeast, fungi, opportunistic enterobacteria, as well as Escherichia and cocci with changed characteristics were detected. 23.5% of the subjects showed a high content of E. coli (greater than 200 million cells per g of feces) accompanied by the increased occurrence of Klebsiella and Escherichia with changed properties. These persons can be regarded as a high risk group with a higher incidence of acute intestinal diseases with unknown etiology.

[Candida infection of the female genitalia. Complaints and clinical findings]

Lachenicht P

Med Klin (Germany, West) Jan 31 1969, 64 (5) p203-6

No abstract.

"The Vaginal Ecosystem"

Mardh, Per-Anders, M.D. Mardh, Per-Anders, M.D., American Journal of Obstetrics and Gynecology, October 1991;165(4): Part II:1163-1168.

No abstract.

[Endogenous candida endophthalmitis: a new therapy]

Mistlberger A, Graf B Augenabteilung der Landeskrankenanstalten Salzburg.

Klin Monatsbl Augenheilkd 1991 Dec;199(6):446-9

A thirty-year-old patient underwent an extensive abdominal surgery because of a precancerosis due to a colitis ulcerosa. An accompanying smoldering panuveitis led under immunosuppressive therapy to the loss of sight of one eye. Only an increasing vitritis of the second eye allowed the diagnosis of an endogenous Candida endophthalmitis (ECE) following a vitrectomy. A systemic administration of the common antifungal medications was impossible because of the patient's pathological blood-picture and a severe cholestasis. We report the successful use of Fluconazol (Diflucan), an antimycotic agent we never used before in this connection.

Anti-Candida activity of calprotectin in combination with neutrophils or lactoferrin.

Okutomi T, Tanaka T, Yui S, Mikami M, Yamazaki M, Abe S, Yamaguchi H. Department of Microbiology and Immunology, Teikyo University School of Medicine, Tokyo, Japan.

Microbiol Immunol 1998;42(11):789-93

The effect of an anti-microbial protein, calprotectin, in combination with neutrophils on the growth of Candida albicans was investigated. The growth inhibition of C. albicans by murine neutrophils was augmented by the addition of a low concentration of

calprotectin prepared from rat peritoneal exudate cells. The concentrations of calprotectin causing 50% inhibition of growth of C. albicans in the absence or presence of neutrophils at an effector-to-target (E/T) ratio of 30 and 60 were estimated to be 0.45, 0.34 and 0.28 U/ml, respectively. The anti-Candida activity of calprotectin was completely inhibited by 2 microM of zinc ion, while it only partially lowered the activity of the combination of calprotectin and neutrophils. Lactoferrin, which is an anti-microbial protein released from neutrophils, strongly inhibited the growth of C. albicans in combination with calprotectin. These results suggest that calprotectin and lactoferrin released from neutrophils may cooperate to inhibit the growth of C. albicans at a local lesion of the infection where there is an accumulation of neutrophils.

Augmented inhibition of growth of Candida albicans by neutrophils in the presence of lactoferrin.

Okutomi T, Abe S, Tansho S, Wakabayashi H, Kawase K, Yamaguchi H. Department of Microbiology and Immunology, Teikyo University School of Medicine, Itabashi-ku, Tokyo, Japan.

FEMS Immunol Med Microbiol 1997 Jun;18(2):105-12

The combined inhibitory effects of neutrophils and lactoferrins on the growth of Candida albicans were examined. Murine or human neutrophils partially inhibited growth of C. albicans when cultured with C. albicans in vitro. The growth inhibition was augmented by a combination of neutrophils and more than 30 microg/ml of bovine lactoferrin or 1 microg/ml of human lactoferrin, concentrations less than 1/10-1/200 their inhibiting concentrations when used alone. The inhibition of C. albicans was also enhanced by combination of neutrophils and bovine apolactoferrin or iron-bound holo-lactoferrin, but not by transferrin. Combination effects of neutrophils and lactoferrin were also observed in a condition where there was no contact between neutrophils and Candida cells. These results suggest that neutrophils inhibit the growth of C. albicans regardless of whether there is direct contact between them and Candida cells: neutrophil growth inhibition effects were augmented in the presence of a physiological concentration of lactoferrin, perhaps through some action of lactoferrin other than chelation of ferric ion.

Australian tea tree oil

Osborne F.; Chandler F. F. Osborne, College of Pharmacy, Dalhousie University, Halifax, NS Canada

Canadian Pharmaceutical Journal (Canada), 1998, 131/2 (42-46)

Australian tea tree oil appears to be an effective topical antimicrobial agent. Its effectiveness, however, is dependent on its appropriateness for a particular indication and should be judged in light of the relative incidence of potential side effects compared with currently available topical medicinal agents. There is a need for stricter regulation as to the source and quality of the oil and therapeutic levels of the oil should be determined for particular indications (such as for 5% or 10% benzoyl peroxide for treatment of mild acne). Indiscriminate use of products containing tea tree oil should be discouraged, particularly if the concentrations of the preparations are not known. Patients should be warned of severe toxicity, especially with ingestion of undiluted oil, and of the potential for sensitivity to dermal products. They should be advised to do a patch test as with other potentially sensitizing agents. In the future, there may be an established place for this oil as a therapeutic agent with specific applications. However, at present, Australian tea tree oil should be used with caution.

"Pathogenesis of Candidiasis: Immunosuppression By Cell Wall Mannan Catabolites"

Podzorski, Raymond P., Ph.D., et al.

Archives of Surgery, November 1989; 124:1290-1294

No abstract.

Influence of lactobacilli on the adhesion of Staphylococcus aureus and Candida albicans to fibers and epithelial cells.

Reid G; Tieszer C; Lam D Department of Microbiology and Immunology, University of Western Ontario, London, Canada.

J Ind Microbiol (England) Sep 1995, 15 (3) p248-53

The ability of organisms to adhere to and form biofilms on fibrous materials is believed to be an important initiating step in the induction of several diseases, such as toxic shock syndrome. Using an in vitro assay, a moderately hydrophobic strain of Staphylococcus aureus (water contact angle 35 degrees) and a hydrophilic Candida albicans (shown by a hexadecane test) were highly adherent to commercial diaper fibers. The lumen side of the diaper was porous and the fibers were very hydrophobic (< 140 degrees), but the internal section was very hydrophilic (0 degrees), presumably for lus strains was present. Surfaces precoated with lactobacilli inhibited staphylococcal adhesion by 26-97%, and candida by 0-67%. When the lactobacilli were used to challenge

adherent pathogens, there was 99% displacement of the S. aureus and up to 91% displacement of C. albicans. Hydrophobic L. acidophilus 76 (54 degrees) and T-13 (80 degrees) were the most effective of five Lactobacillus isolates tested at interference by precoating. The moderately hydrophilic L. casei var rhamnosus GR-1 (33 degrees) was the most effective at displacing the yeast. Experiments with uroepithelial cells also showed that the lactobacilli could significantly interfere with the adhesion of both pathogens to the cells. The results demonstrate the rapidity with which two pathogens adhered to fibers and epithelial cells, and raised the possibility that members of the normal female urogenital flora might interfere with infections caused by these organisms.

"Vaginal Flora and Urinary Tract Infections"

Reid, Gregor, Ph.D., et al Current Opinion in Infectious Disease, 1991;4:37-41

No abstract.

A new protocol for antimicrobial testing of oils

Smith M.D.; Navilliat P.L.

Journal of Microbiological Methods (Netherlands), 1997, 28/1 (21-24)

This paper describes modifications of the Food and Drug Administration's 1991 proposed rule for topical antimicrobial drug products for over-the-counter human use, affecting first aid antiseptic drug product testing for recovery of test bacteria from tea tree oil . Because the FDA's proposed method provided for the testing of water soluble and/or miscible products, along with the use of a chemical neutralizer, Mitech Laboratories, Inc. developed a new method for testing of water insoluble oils using a non-toxic solvent. In a bactericidal assay, specific sterile diluting fluids are used as a non-toxic solvent followed by a rinse. The bacteriological retentative membrane filtration method, rather than chemical neutralization, is used for recovery of bacteria along with accurate organism counting. This new method provides a mechanism to enable general recognition of effectiveness for oil-based antiseptic drug products in compliance with the Federal Food, Drug, and Cosmetic Act.

"Anticandidal and Anticarcinogenic Potentials For Garlic"

Tadi, Padma P., MS, et al

International Clinical Nutrition Review, October 1990;10(4):423-429.

Cooperative anti-Candida effects of lactoferrin or its peptides in combination with azole antifungal agents.

Wakabayashi H, Abe S, Okutomi T, Tansho S, Kawase K, Yamaguchi H. Nutritional Science Laboratory, Morinaga Milk Industry Co., Ltd., Kanagawa, Japan.

Microbiol Immunol 1996;40(11):821-5

The effects of lactoferrin (LF), an antimicrobial protein secreted in body fluids, and its peptides in combination with azole antifungal agents were investigated by the micro-broth-dilution meth

od in a study of Candida albicans. In the case of LF, its pepsin hydrolysate (LFhyd) or the LF-derived antimicrobial peptide Lactoferricin B (LF-B), the concentrations required to inhibit the growth of Candida decreased in the presence of relatively low concentrations of clotrimazole (CTZ). The minimum inhibitory concentration (MIC) of all azole antifungal agents tested was reduced by 1/4-1/16 in the presence of a sub-MIC level of each of these LF-related substances. Polyene and fluoropyrimidine antifungal agents did not show such a combined effect with these LF-related substances. The anti-Candida activity of LF or LF-B in combination with CTZ was shown to be synergistic by checkerboard analysis. These results indicate that LF-related substances function cooperatively with azole antifungal agents against C. albicans.

CANDIDA (YEAST, FUNGAL) INFECTIONS
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[Candida infection of the female genitalia. Complaints and clinical findings]

Lachenicht P
Med Klin (Germany, West) Jan 31 1969, 64 (5) p203-6

No abstract.

Dietary supplement of neosugar alters the fecal flora and decreases activities of some reductive enzymes in human subjects.

Buddington RK; Williams CH; Chen SC; Witherly SA
Department of Biological Sciences, Mississippi State University, Mississippi State 39762-5759, USA.
Am J Clin Nutr (United States) May 1996, 63 (5) p709-16

The influence of dietary fructooligosaccharide (neosugar) on the fecal flora and activities of reductive enzymes was studied in 12 healthy, adult human subjects fed a controlled diet for 42 d and given 4 g neosugar/d between days 7 and 32. Fecal samples were collected before, during, and after supplementation with neosugar to enumerate total anaerobes, aerobes, bifidobacteria, and enterobacteria, and to assay for beta-glucuronidase, nitroreductase, and glycocholic acid hydroxylase. Although the controlled diet caused an increase in total anaerobes and bifidobacteria, the highest densities occurred during supplementation with neosugar. Total aerobes and enterobacteria were less affected by diet and neosugar. Neosugar caused beta-glucuronidase and glycocholic acid hydroxylase activities to decrease 75% and 90%, respectively; both increased after supplementation with neosugar was stopped. Nitroreductase activity declined 80% after the control diet was started, but was not affected by neosugar. These findings indicate that 4 g neosugar/d alters the fecal flora in a manner perceived as beneficial by decreasing activities of some reductive enzymes.

In vitro fructooligosaccharide utilization and inhibition of Salmonella spp. by selected bacteria.

Oyarzabal OA; Conner DE
Department of Poultry Science, Auburn University, Alabama 36849-5416, USA.
Poult Sci (United States) Sep 1995, 74 (9) p1418-25

In vitro experiments were conducted to determine:

1) inhibitory capacities of potential direct-fed microbial bacteria against Salmonella serotypes; and

2) the ability of Bifidobacterium bifidum, Enterococcus faecium, Lactobacillus casei, Lactococcus lactis, Pediococcus sp., and

Salmonella spp. to grow in media containing fructooligosaccharides (FOS-50 or FOS pure formulation) as the only carbohydrate source.

Thirteen bacteria (two strains of Bacillus coagulans, Bacillus licheniformis, Bacillus subtilis, B. bifidum, E. faecium, two strains of Lactobacillus acidophilus, L. casei, Pediococcus sp., Propionibacterium acidopropionici, P. jensenii, and Propionibacterium sp.) were tested for inhibition of six Salmonella serotypes (S. california, S. enteritidis, S. heidelberg, S. mission, S. senftenberg, and S. typhimurium) using a spot-the-lawn technique. Bifidobacterium bifidum, E. faecium, all lactobacilli, and Pediococcus sp. clearly inhibited growth of all Salmonella serotypes. In the growth experiments, E. faecium, L. lactis, and Pediococcus sp. grew in media with either FOS-50 or the pure formulation of FOS as the sole carbohydrate source. All tested Salmonella serotypes utilized FOS-50 for growth; however growth varied among the serotypes. In contrast, none of the Salmonella serotypes grew in media containing the pure formulation of FOS as the only carbohydrate source.

Dietary fructooligosaccharide, xylooligosaccharide and gum arabic have variable effects on cecal and colonic microbiota and epithelial cell proliferation in mice and rats.

Howard MD; Gordon DT; Garleb KA; Kerley MS
Department of Animal Science, University of Missouri, Columbia 65211, USA.
J Nutr (United States) Oct 1995, 125 (10) p2604-9

Two experiments were conducted to determine if supplementing soluble fiber (fructooligosaccharide, xylooligosaccharide or gum arabic) to a semi-elemental diet would beneficially change cecal and colonic microbiota populations and enhance epithelial cell proliferation. Experiments 1 and 2 used identical dietary regimens; mice and rats were given free access to a powdered semi-elemental diet. Animals were assigned to one of the four following treatment groups: control, no supplemental dietary fiber, fructooligosaccharide, xylooligosaccharide and gum arabic. Dietary fiber was supplied via drinking water at 30 g/L. In Experiment 1 populations of Bifidobacteria and total anaerobic flora were enumerated from the contents of the cecum and colon of weanling mice. Consumption of fructooligosaccharide increased ($P < 0.05$) the concentrations of Bifidobacteria and the ratio of Bifidobacteria to total anaerobic flora. In Experiment 2 tissue from the cecum and distal colon of weanling rats was examined for morphological changes of the mucosa. Consumption of xylooligosaccharide increased ($P < 0.05$) cecal crypt depth and labeling index relative to the other three treatments. Consumption of gum arabic and the control diet increased ($P < 0.01$) cecal proliferation zone. Consumption of xylooligosaccharide and the control diet increased ($P < 0.01$) cecal cell density (number of cells in a vertical-half of the crypt). Distal colonic crypt depth was greatest ($P < 0.05$) in controls and rats fed fructooligosaccharide, intermediate in those fed gum arabic, and smallest in those fed xylooligosaccharide. These results suggest that fructooligosaccharide effectively stimulates growth of Bifidobacteria and xylooligosaccharide supports a modest enhancement of cecal epithelial cell proliferation.

A comparison of susceptibility to five antifungal agents of yeast cultures from burn patients.

Still JM Jr; Law EJ; Belcher KE; Spencer SA
Augusta Regional Medical Center, Georgia, USA.
Burns (England) May 1995, 21 (3) p167-70

Patients with significant degrees of immunocompromise, such as cancer, AIDS and large burns, who have received significant amounts of antibiotics, may develop infections with yeast organisms. Over a 3-year period, all patients with positive fungal blood cultures and most wounds of patients with large burns considered to be a risk of yeast infection were selected and tested for their susceptibility to five antifungal agents, amphotericin B, ketoconazole, miconazole, diflucan, and 5-fluorocytosine. In all, 244 specimens of yeast were tested: 142 Candida albicans, 52 Candida parapsilosis, 26 Candida tropicalis and 13 Trichosporon beigelii. A limited number of other isolates of Candida (12) were also encountered. All Candida organism were sensitive to amphotericin B. There was wide variation in regard to the susceptibility to the other four agents, with C. albicans and C. tropicalis being largely resistant to miconazole and ketoconazole. T. beigelii was recovered in 13 patients. One-half of these organisms was resistant to amphotericin B. Awareness of variations in species and susceptibility are helpful in the selection of appropriate therapeutic antifungal agents.

[A trial of the use of diflucan (fluconazole) in patients with vaginal candidiasis]

Dmitrieva NV, Sokolova EN, Makhova EE, Petukhova IN
Antibiot Khimioter 1993 Dec;38(12):39-41

Fifty females with vaginitis due to Candida albicans were treated with fluconazol (diflucan) in a single dose of 150 mg administered per os. A complete elimination of the clinical signs in 42 out of 50 patients (84 per cent) and a significant improvement of the clinical picture in 4 out of 50 patients (8 per cent) were recorded. The cultures of the smears produced no fungal growth with respect to 31 out of 36 patients (86.1 per cent), while microscopically the presence of the fungus with the signs of pathomorphosis was detected. Such cells could be a source of the fungal reinfection. Therefore, diflucan proved to be a highly efficient drug in the treatment of vaginal candidiasis and might be considered as an additional agent for the therapy of the disease.

[Fluconazole--a new antifungal agent]

Dobloug JH
Infeksjonsmedisinsk avdeling, Ulleval sykehus, Oslo.
Tidsskr Nor Laegeforen 1992 Jun 10;112(15):1961-3

Fluconazole (Diflucan) is a new triazole antifungal agent that is effective against a wide range of fungi and has a favourable pharmacokinetic profile. Fluconazole is absorbed well after oral intake independent of food intake. Fluconazole is given once daily, in a dose of 50-400 mg. The dosage is the same for oral and parenteral administration. Tissue penetration is good, as is the concentration in cerebrospinal fluid. Fluconazole should not be given to children under 16 years of age, nor to pregnant or breast-feeding women. In Norway, fluconazole is indicated for treatment of candida vaginitis that is resistant to other treatment, invasive candida infection, candida stomatitis in immunocompromised hosts, and cryptococcalmeningitis.

[Endogenous candida endophthalmitis: a new therapy]

Mistlberger A, Graf B
Augenabteilung der Landeskrankenanstalten Salzburg.
Klin Monatsbl Augenheilkd 1991 Dec;199(6):446-9

A thirty-year-old patient underwent an extensive abdominal surgery because of a precancerosis due to a colitis ulcerosa. An accompanying smoldering panuveitis led under immunosuppressive therapy to the loss of sight of one eye. Only an increasing vitritis of the second eye allowed the diagnosis of an endogenous Candida endophthalmitis (ECE) following a vitrectomy. A systemic administration of the common antifungal medications was impossible because of the patient's pathological blood-picture and a severe cholestasis. We report the successful use of Fluconazol (Diflucan), an antimycotic agent we never used before in this connection.

"Perspective Evaluation of Candida Antigen Detection Test For Invasive Candidiasis and Immunocompromised Adult Patients With Cancer"

Escuro, Ruben S., M.D., et al
The American Journal of Medicine, December 1989;87(621-627)

No abstract.

"Pathogenesis of Candidiasis: Immunosuppression By Cell Wall Mannan Catabolites"

Podzorski, Raymond P., Ph.D., et al
Archives of Surgery, November 1989; 124:1290-1294

No abstract.

Vaginitus and yogurt consumption

[No author listed]

Thirteen female patients, with chronic yeast candidiasis, finished a study in which they ingested 8 ounces of yogurt with a live lactobacillus culture for 6 months. The lactobacillus acidophilus species was noted to produce hydrogen peroxide. There was a threefold decrease of infections in patients consuming yogurt containing lactobacillus acidophilus. The mean number of infections for 6 months was 2.54 in the control group, versus .38 in those containing yogurt. The colonization of yeast decreased from 3.23 per 6 months in the control arm to .84 in the yogurt arm. It is concluded that daily ingestion of yogurt containing lactobacillus acidophilus decreased candidal colonization and infection.

Garlic

[No author listed]

This is an extensive review article on the physiologic aspects of garlic with regards to cancer prevention and treatment. This article lists approximately 30 studies from 1949 through 1986 on garlic and cancer. Epidemiologically garlic and onion consumption is associated with reduced mortality from cancer. Garlic is rich in sulfur compounds and may be important in several detoxification pathways. Garlic has antitumor and cancer inhibition properties. There is presently no data from the National Toxicology Program regarding the toxicity of garlic though in animal models negative health effects at very high doses have been reported. Other documented effects of garlic include antiobiotic and antifungal activity, fibrinolysis and platelet aggregation inhibition. The trace elements selenium and germanium, antioxidants in their own right, are constituents of Japanese garlic. Further studies in humans on garlic and cancer are encouraged.

"Garlic: A Review of Its Relationship to Malignant Disease"

Dausch, Judith G., Ph.D., RD and Nixon, Daniel W., M.D.
Preventive Medicine, May 1990;19(3):346-361

This review states that Kyolic garlic extract enhanced the elimination of candida albicans in infected animals. Kyolic can inhibit aflatoxin or benzopyrene induced mutagenesis. It can also inhibit aflatoxin from binding to DNA. Garlic reduces the formation of organosoluble metabolites and increases the formation of water soluble metabolites facilitating elimination of the carcinogen.

"Anticandidal and Anticarcinogenic Potentials For Garlic"

Tadi, Padma P., MS, et al
International Clinical Nutrition Review, October 1990;10(4):423-429.

Vaginal Flora

This article reviews the role of the vaginal flora and the pathogenesis and prevention of urinary tract infections. It is noted that antimicrobial agents and spermacides can disrupt the vaginal flora making the patient more susceptible to bladder and vaginal infections. Supplementation of lactobacillus strains have some clinical potential. Also immunizations have shown some promise as well. Lactobacilli dominate the vaginal flora of healthy women. They help maintain low vaginal pH by the production of lactic acid, compete for space on the vaginal epithelium, produce hydrogen peroxide and antimicrobial substances, and stimulate immune function. Systemic antibiotic administration can definitely alter vaginal flora. Recent studies of prophylactic antimicrobial treatment have shown an increased susceptibility to reinfection. Induction in monkey models of ecoli colonization from Amoxicillin use has been corrected with indigenous organism supplementation including lactobacilli. Long term use of antibiotics for prostatitis has been found to destroy the normal urethral flora that would otherwise interfere with virulent organisms. The spermicide nonoxynol-9 can also affect the urogenital flora negatively. The uropathogens and candida albicans were found to survive in up to 25% concentration of this product and grow and adhere better to cells when exposed to nonoxynol-9. Patients who use spermacides may be more susceptible to repeated infections by yeast and bacteria. It may be that estrogen has an effect on the normal flora and that susceptibility to infection is increased during fluctuations of female hormones. A direct linkage with hormones has not been proven yet. The application to prevent urinary tract infections with lactobacilli is a relatively new concept. In the authors' work 16 commercial lactobacillus products were examined; 11 were found to be contaminated with pathogens and only 4 contained the lactobacillus acidophilus as stated on the label. There is evidence from the literature that lactobacilli can prevent urogenital as well as intestinal infections. In one study freeze dried lactobacilli suppositories were given intravaginally once weekly for 1 year to 8 patients with recurrent UTI's. The results showed an impressive 78% reduction in the incidence of infection. It is possible that stimulation of IgA antibodies may help prevent urinary tract infections as well. This has been attempted by using a product called

Urovac (Solco-Basel, Switzerland) that is comprised of killed, whole, uropathogenic bacteria. This therapy was given intramuscularly 3 times a week with a follow-up at 12 months. There was a reduction in immunized patients developing UTI compared to controls. This protection was correlated later with increased urinary IgA antibodies. It is not known how injections of uropathogens could cause bladder IgA antibodies. The use of oral vaccinations using e. coli membranes raises similar questions. The authors conclude that there is a potential for vaccination to prevent urinary tract infections as well as chronic vaginal candidiasis. A subcutaneous vaccine for candida ribosomes and adjuvant proteoglycans for klebsiella pneumonia was given orally in capsule form to 22 women at a dose of 2 to 9 capsules a day for 4 days over a 3 week period, and then for 4 consecutive days a month for 5 months. Vulvovaginitis was reduced from 3.6 to .6 attacks per 6 months.

"Vaginal Flora and Urinary Tract Infections"

Reid, Gregor, Ph.D., et al
Current Opinion in Infectious Disease, 1991;4:37-41

No abstract.

Candida Albicans

[No author listed]

It is suspected that in recurrent candida albicans vaginitis there is a decreased cellular immune response. This study evaluated the role of circulating progesterones and the effect on immune response to candida albicans. There was approximately a 50% decrease in candida albicans-induced lymphocyte proliferation observed in the presence of luteal phase levels of progesterone 25 mg/ml, as opposed to the proliferative phase of .15 mg/ml. It appears that progesterone inhibits lymphocyte proliferation through a monocyte- dependent mechanism. There also appear to be individual differences in the capacity of a person's monocytes to down regulate the lympho- cyte response to candida albicans. The authors conclude that fluctuations in a woman's monocyte activity, in response to genetic, hormonal and environmental factors, may affect her cell mediated immune response to candida albicans. Identifying highly susceptible females along with augmentation of the cellular immune response to candida albicans may be of benefit in preventing recurrent candida vaginitis.

"Regulation of The Immune Response to Candida Albicans by Monocyte and Progesterone"

Kalo-Klein, Aliza, Ph.D. and Witkin, Steven S.
American Journal of Obstetrics and Gynecology, 1991;164:1351-4

No abstract.

Hydrogen Peroxide Producing Organisms

[No author listed]

Lactobacillus in the vaginal tract produces hydrogen peroxide. It is present in 96% of normal vaginas but is absent in women suffering from chronic vaginosis. It is noted that the production of hydrogen peroxide by lactobacilli can be toxic to Gardenerella vaginalis. Hydrogen peroxide, halides such as chlorides, and enzyme peroxidase are toxic to the reproduction of bacteria, viruses and mammalian cells. Chloride and peroxidase are found in the cervical mucus and at certain levels in the vaginal fluid. Hydrogen peroxide is produced by lactobacilli. The author states that there may be a simple procedure of recolonization of the vagina, using peroxide producing bacteria and thereby eliminating the vaginosis.

"Hydrogen Peroxide-Producing Organisms Toxic To Vaginal Bacteria"

Infectious Disease News, August 8, 1991;5

No abstract.

Vaginal Ecosystem

[No author listed]

Things that can change the vaginal flora include:

1) antibiotics, corticosteroids, antiviral and antifungal agents, irradiation,
2) vaginal douching,
3) malformation and anatomic deformity after surgery or radiation,
4) cysts, hymen, polyps,
5) immunosuppressive conditions such as AIDS,
6) hormonal changes, use of oral contraceptives or medicinal therapies,
7) uncontrolled diabetes,
8) foreign objects, i.e.
9) intrauterine devices or retained tampon or diaphragm
10) and spermicides.

The vaginal flora is highly susceptible to numerous endogenous and exogenous influences. It is noted that the current belief is the intestinal tract is a reservoir for organisms found in the vagina of women with bacterial vaginosis.

"The Vaginal Ecosystem"

Mardh, Per-Anders, M.D.
Mardh, Per-Anders, M.D., American Journal of Obstetrics and Gynecology, October 1991;165(4): Part II:1163-1168.

No abstract.

Candida Vaginitis, Lactobacillus Acidophilus and Yogurt

[No author listed]

In 33 patients with recurrent candida vaginitis, there was found a three-fold decrease in infections when patients consumed yogurt containing lactobacillus acidophilus for a period of 6 months. The mean number of infections per 6 months was 2.54 in the control group, and .38 per 6 months in the yogurt treated group. Candida colonization decreased from a mean of 3.23 per 6 months in the control group to .84 for 6 months in the yogurt group. The authors conclude that daily ingestion of 8 ounces of yogurt containing lactobacillus acidophilus decreased both candida colonization and infection. It is thought that candida is autoinoculated since identical strains are seen in the mouth, anus and vaginal areas. Other studies have shown that gastrointestinal colonization does not have much to do with vaginal reoccurrences. There was an association between the presence of lactobacillus species in the rectum and the vagina. Yogurt ingestion had a marked effect on the incidence of candida infection in the vagina and the rectum. The lactobacillus strains in yogurt were found to produce hydrogen peroxide. The authors feel that a gastrointestinal strain of lactobacillus acidophilus colonized the vaginal tract of their patients.

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