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участю «Перший крок в науку – 2024»**

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За зміст опублікованих матеріалів відповідальність несуть автори

ТЕРАПІЯ



INTERNAL MEDICINE

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Introduction: *E. coli* is a gram-negative, facultative anaerobic, non-sporulating coliform bacterium, can be found as a colonizer of infected wounds. Its ability to biofilm formation and resistance to antimicrobial drugs development make it difficult to eliminate from the infected wound. Antiseptics are an essential part of wound infection control practices and in preventing nosocomial infections.

The aim was to find out the most effective antiseptics and to establish their MIC and MBC against resistant *E. coli* collected from the infected wounds.

Materials and methods. We examined 9 antiseptics using broth two-fold dilution technique to evaluate MIC and MBC of each extract. Microorganisms are identified by «ENTEROtest 23» and PCR in SGUL. Isolated *E. coli*: ESBLs (MIC of AMO – 250.0 - 1000.0 µg/mL), MLS-resistance (MIC of ERY – 250.0 - 2000.0 µg/mL), TET-resistance (MIC of TET – 250.0 - 1000.0 µg/mL) and AmpC-resistance genotypes. Antibacterial activity of antiseptics was determined in MH broth, dispensed at 200 µL/well in 96-well microtiter plates along with compounds to test. Bacterial growth was evaluated based on the change of the OD, at wavelength 495 nm. Gene5 and Microsoft Office Excel 2016 - statistical processing of the results.

Results: Serial two-fold dilution assay has shown that 80.5 % of antiseptics inhibited growth of all strains in dilution 1/40 – 1/80 compared with growth curve of control (decrease of OD). The antimicrobial effect of all antiseptics was equally manifested against antibiotic-resistant and sensitive strains. Decasan and miramistin inhibited the growth of all tested strains in concentrations ranging 2.5 – 5.0 µg/ml and exhibited bactericidal activity in concentrations 5 - 10.0 µg/ml. Both antiseptics can solubilize cellular membranes with the consequent formation of micellar aggregates, miramistin binds to microbial DNA. Chlorhexidin (0.12 %) and betadine (10 %) showed moderate antimicrobial action. Chlorhexidin was active in concentrations 4.6 - 18.75 µg/ml, while betadine inhibited all strains in concentrations 15.6 - 62.5 µg/ml and was more effective than alcohol iodine (MIC range 78.1 - 156.2 µg/ml).

In our investigation we also examined chlorophyllipt ethanolic solution (*Chlorophyllipti spissum* 60%, 10 mg/ml) – a plant origin antiseptic that has an antibacterial effect against resistant and sensitive staphylococci. It's MIC values ranged from 64.5 to 250 µg/ml. So, chlorophyllipt showed the same antimicrobial activity as hydrogen peroxide (MIC 93.75 187.5 - µg/ml). Sodium tetraborate turned out to be the least active against the studied strains, its MICs ranged from 200 to 1250 µg/ml.

Conclusion. The present investigation demonstrates that significant number of antiseptics are effective against clinical isolates of resistant *E. coli* collected from the infected wounds. The most effective are decasan and miramistin. Chlorophyllipt showed the same antimicrobial activity as hydrogen peroxide.

Ananya Dwivedi

LUNG HYPERINFLATION - A PROGNOSTICALLY SIGNIFICANT MARKER IN GERIATRIC PATIENTS

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Background: Lung hyperinflation is a common finding in patients with chronic obstructive pulmonary disease (COPD) observed via plain radiograph. Among people older than 65 years, the risk of developing COPD increases five times compared to 40 year olds (Easter M. et al., 2020). In addition, hyperinflation may be found in patients with the Tiffeneau index > 0,7. In most cases, this radiological finding is not given due attention, therefore further diagnosis and treatment is either delayed or insufficiently carried out.

Aim: to assess the prognostic significance of hyperinflation in elderly patients.

Materials and methods: A search for publications in databases PubMed, Cochrane library, Google Scholar over the last 10 years was conducted.

Results: For the first time in 2024, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) included hyperinflation as a separate section. A clinically significant growth in lung gas volume at the end of spontaneous expiration may contribute to dyspnea, exercise intolerance, increased hospitalization, respiratory failure and higher mortality. Hyperinflation is a common finding in the preserved ratio impaired spirometry (PRISm) COPD subtype that has been associated with a significant risk of mortality, especially mortality from cardiovascular disease (Adibi A., Sadatsafavi M., 2020). Age-related pulmonary changes are accompanied by a decrease in regenerative capacity and an increase in susceptibility to acute and chronic lung diseases. Martani M. et al. in 2023 found that the presence of lung hyperinflation accelerates aging. Mitochondrial dysfunction, increased oxidative stress and telomere shortening contribute to the inability of lung cells to maintain the original homeostasis (Cho S.J., Stout-Delgado H.W., 2020). Hyperinflation can be controlled with the help of rational pharmacotherapy with bronchodilators, oxygen support, heliox and a properly selected complex of pulmonary rehabilitation, pursed lip breathing, inspiratory muscle training (GOLD, 2024). Vanfleteren et al. in 2018 demonstrated that even static lung hyperinflation allows for the benefit from pulmonary rehabilitation in the form of reduced dyspnea, readmissions and mortality. Severe hyperinflation in emphysema can lead to a decrease in the ability of ventricles to pump blood, leading to heart failure. In this case, surgical intervention or bronchoscopic lung reduction may be required.

Conclusion: Lung hyperinflation can be considered as a potential prognostic marker in geriatric patients.

Anurag Krishna

PREVALENCE OF SYMPTOMS OF GASTROINTESTINAL DISEASES AMONG ENGLISH-SPEAKING STUDENTS IN CONTEXT OF EXPOSURE TO KNOWN RISK FACTORS

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Abstract. Hypodynamia and associated obesity, depression and anxiety are recognised risk factors for numerous diseases of the digestive tract. Studying their impact on the young population is a particularly urgent task, given the spread of online learning in recent years.

Purpose of the study. To study the influence of the above-mentioned risk factors on the appearance of the most common gastrointestinal symptoms

Material and methods. In an online format, using the Microsoft Forms service, a survey of 252 English-speaking students at medical universities in Ukraine. The survey included 3 questionnaires: for the assessment of gastrointestinal symptoms (GSRS), for the study of physical activity (IPAQ), hospital anxiety and depression scale (HADS). Body weight, height, and waist circumference were also measured. Statistical processing was carried out using the MedCalc® version 12.5.0.0 program.

Results and Conclusion. In general, students have a tendency to a sedentary lifestyle (68% of respondents), which they associate with the challenges of studying in the conditions of martial law in Ukraine, frequent lockdowns. By means of regression multivariate analysis, a reliable influence of excess body weight on the development of reflux symptoms was revealed. A sedentary lifestyle contributes to the appearance of complaints of diarrhoea, constipation, gastric dyspepsia. Symptoms of anxiety are associated with any pain in the abdominal cavity. Students with low physical activity more often show symptoms of depression.

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