

DECISION SUPPORT SYSTEM FOR SELECTING THERAPEUTIC TACTIC IN ACUTE INTESTINAL INFECTIONS CAUSED BY OPPORTUNISTIC MICROFLORA

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Relevance. At the present stage of development of medicine success of many clinical processes are inextricably linked to the use of computerized technologies. Analysis of existing decision support systems (DSS), adapted for practicing physicians, indicating their lack of functional efficiency, because they do not account for arbitrary initial conditions of the pathological process. To solve this problem was the use of promising ideas and basic methods of information and intellectual extreme technology that is based on maximizing the information capacity of DSS in the process of learning machine based on the intersection of classes of recognition, characterizing the functional state of the controlled process.

The purpose of the study was to create DSS for selecting therapeutic tactic in acute intestinal infections (AII) caused by opportunistic microflora (OM).

Materials and methods. Training classes matrix recognition DSS had 30 implementations, consisting of 19 signs of recognition, which included the results of standard microbiocenosis research in bowel in Ig CFU/g (10 indices), serum concentrations of sIg A (mg/L), IL-1 beta and IL-4 (pg/ml), haematological parameters: ESR (mm/h), the contents of leukocytes in the peripheral blood ($10^9/L$), integrative indexes of endogenous intoxication (leukocyte intoxication index (LII), hematological toxicity index (HTI), the index shift leukocytes (ISL) and lymphocytic index (Ilim)). The learning algorithm is fed DSS as two-cycle integration procedure for finding the global maximum information criterion functional efficiency (MFE) and the definition of its function in the workspace. At the stage of the examination were conducted pilot tests to confirm the performance and reliability of the DSS – the doctor based on the input of pattern recognition DSS produced dimensioning Kullback criterion for each case, followed by determining the membership of a given class recognition.

Results. Education of DSS adapted for patients with AII caused by OM was carried out using four classes alphabet recognition. In this class X_1^0 matched control group (healthy blood donors); X_2^0 class consisted of patients who had a need for cleaning of the digestive tract from OM. In class X_3^0 comprised of individuals who have had a deficit mucosal microflora and X_4^0 to the class were assigned patients with dissociation in intestinal flora – high microbial number of OM with a significant decrease or complete absence of bifidobacterias and lactobacills. From the values of hematological and immunological parameters specified classes were similar. For each class DSS was tasked differential treatment tactics. Thus, individuals from X_2^0 class composition was proposed usages colloidal silver having a particle size of 25 nm at 10 mg/L 100 ml three times a day for 5 days in a basic treatment (lavage of stomach and/or intestine, diet, oral and/or parenteral rehydration, enzymes, sorbents), belonging to the class X_3^0 was recommended combine probiotic Lacto in addition to the basic treatment, and to the class X_4^0 – administration of colloidal silver and probiotic with basic therapy. Physician based on the input of pattern recognition DSS calculated parameters Kullback criterion for each case, with subsequent determination of belonging to a given class recognition. When comparing the selected treatment strategies depending on the variations studied attributes DSS and internist with experience more than 10 years, it was noted the coincidence of the final decisions.

Conclusion. The algorithm of functioning of our proposed DSS based on arbitrary initial conditions of immunological, hematological and microbiological indicators introduced by a doctor, and the intersection of classes of recognition, characterizing the functional state of the controlled process of the disease. Optimal control tolerances and control the impact of tolerances for signs of recognition in the functional efficiency of the DSS training has improved the selection regimen for treatment of AII caused by OM.