To study variability of enzymatic apparatus of opportunistic enterobacteria.
Clinical strains of Morganella morganii, Citrobacter freundii, Proteus mirabilis isolated from patients treated in Irkutsk Regional Hospital for Infectious Diseases. Activity of cellulase and lipase as well as amount of auxins and gibberellins was studied in these bacteria at different cultivation temperatures.
It was shown that studied species isolated from humans enterobacteria are able to produce plant growth regulators amount of which depends from cultivation temperature and type of microorganism. Activity of cellulase sharply rises if temperature falls.
Obtained results show high adaptation potential of opportunistic bacteria from Enterobacteriaceae family. Switch on saprophytic mechanism after fall of temperature to environment-corresponding values allows them to survive in soil and arrange different interactions with soil biota including plants.
Acute intestinal infections were clinically and epidemiologically studied in children residing in the towns with different quantitative and qualitative composition of ambient air pollutants and in the districts of a town, which differ in the level of technogenic ambient air pollution. Six hundred and eighty patients with different types of shigellosis and 421 patients with salmonellosis admitted to the infection hospitals of the towns of Angarsk (an intensively polluted locality) and Irkutsk (a better ecological area) were examined in 1995 to 2000. The technogenic ambient air pollution was found to exert a noticeable impact on the incidence with S. sonnei dysentery. In poor environmental areas, all the infections under study are characterized by a great burden, duration, more severe clinical symptoms, and poor laboratory changes in the presence of a decreased responsiveness.
This article describes results of the immunological study of school-aged children residing in cities with different levels of the technogenic air pollution. Children from cities with the highest level of the technogenic pollution had a high number of immature neutrophils (band cells) and eosinophils. The children living in these ecologically unfavorable areas have presented a reduction of T-cell antigen receptor CD3, CD4, CD8, CD20, CD16, CD95. This indicates to that both T-cell and B-cell immunity is suppressed. The decline of the phagocytic function in neutrophils indicates to the suppression of the nonspecific host defense mechanisms also.
[Approaches to managing an epidemic process based on self-regulating mechanisms of the parasitic system].

https://arctichealth.org/en/permalink/ahliterature201206

Author: E D Savilov
Date: Jun-1999
Language: Russian
Publication Type: Article
Keywords: Humans
Infection Control
Parasitic Diseases - epidemiology - prevention & control
Siberia - epidemiology
PubMed ID: 10439919 View in PubMed

Changes in agent variability and time course of disease incidence during a year (as exemplified by dysentery).

https://arctichealth.org/en/permalink/ahliterature195974

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Date: Nov-2000
Language: English
Publication Type: Article
Keywords: Dysentery, Bacillary - epidemiology
Humans
Incidence
Russia - epidemiology
Seasons
Shigella sonnei
Time Factors
Abstract: The vulnerability of epidemic process during the period of minimum annual incidence of the disease is validated. Biological properties of Shigella sonnei are studied and their variability examined using the index for evaluation of the mean number of variations for a sign. Minimum agent heterogeneity coincides with minimum incidence of disease and maximum heterogeneity with its seasonal rises.
PubMed ID: 11182825 View in PubMed
Characteristics of acute respiratory viral infections in children under conditions of technogenic environmental pollution

https://arctichealth.org/en/permalink/ahliterature31991

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Language: Russian

Publication Type: Article

Keywords: Acute Disease  
Adolescent  
Child  
Child, Preschool  
Comorbidity  
Comparative Study  
English Abstract  
Environmental Pollution - adverse effects  
Humans  
Respiratory Tract Infections - epidemiology - immunology  
Siberia - epidemiology  
Urban Population  
Virus Diseases - epidemiology - immunology - virology

Abstract: The results of observations on children with acute virus respiratory infections (ARVI) and who had long been residents of zones with different levels of technogenic pollution of the atmospheric air are presented. The technogenic pollution of the environment has been found to exert influence on the spread and clinical course of ARVI in children, this influence being the more pronounced, the higher is the level of xenobiotics in the atmospheric air. The severity of the disease is noted to depend on the development of a number of syndromes, aggravating the course of ARVI, such as the neurotoxic and bronchoobstructive syndromes. Bronchial and ENT lesions are the most frequent complication of the main disease. The child population residing under the conditions of high technogenic environmental pollution should be regarded as a group of risk subject to the aggravated course of ARVI, and the examination of sick children should be made with due regard to this circumstance.

PubMed ID: 11550557 View in PubMed

[EPIDEMIOLOGIC MANIFESTATIONS OF VIRAL HEPATITIS C IN REPRESENTATIVES OF CAUCASIAN AND MONGOLOID RACES]

https://arctichealth.org/en/permalink/ahliterature271676
Abstract: Present comparative epidemiologic characteristics of viral hepatitis C in Mongolia and Irkutsk Region taking into account racial origin of the studied populations.

The studies were carried out in 2009-014 on the territory of Irkutsk Region in Mongolia. Prevalence of viral hepatitis based on serological monitoring, virus RNA detection, risk factors, change in structure of circulating genotypes, hepatocellular carcinoma morbidity were studied.

Epidemiologic manifestations of viral hepatitis C in Mongolia, in contrast to Irkutsk Region, are characterized by a wider prevalence of the disease, predominance of the fraction of seropositive individuals in age category of above 50 years and predominance of genotype 1 virus in circulation. In recent years an evolution of diversity of circulating virus genotypes, took place towards a reduction of the fraction of genotype in Mongolia and Russia due to increase of the fraction of genotype-3. Expressed differences in average-annual values of hepatocellular carcinoma morbidity were detected, that were more than 10 times higher among Mongoloids compared with Caucasians.

Pronounced differences were detected in manifestations of epidemic process of viral hepatitis C in Mongolia and Asian part of Russia, represented by Eastern Siberia, that are associated with ethnic, social and, cultural living conditions of the indigenous population.
The on-going evolution of the epidemic process is under active influence of a new regulatory risk factor, environmental pollution of technogenic origin. The negative influence of ecological pressure on the manifestations of infectious diseases is apparent as destabilization of the epidemic processes, increased severity of infections, impaired epidemiological and immunological efficacy of vaccine prophylaxis in the child population. The most vulnerable component in the epidemic process is the minimal period of infectious morbidity. As shown in an epidemiological experiment, it is in this period that especially active preventive measures must be taken to ensure efficacious management of infection.
Detection of nucleotide sequences of genes controlling synthesis of pathogenicity factors in clinical strains of opportunistic enterobacteria isolated from children with acute intestinal infections (AII), as well as their association with resistance to antibiotics and the course of the infectious process.

175 clinical strains obtained from children with AII undergoing treatment in Irkutsk state infectious diseases hospital (2007-2010) were studied. Primers to a number of genes detected in Escherichia coli pathogenicity islands, controlling type S and type 1 adhesion; formation of hemolysins; iron-regulatory protein synthesis; capsule formation were used in the study. PCR products analysis was performed by agar gel electrophoresis.

Genetic determinants of pathogenicity were detected in bacteria genera Klebsiella, Citrobacter, Enterobacter, Proteus, Kluyvera, Morganella, Pantoea, Serratia. Fragments of hlyA and hlyB genes (hemolysin production) were detected more frequently; less frequently--sfaA, sfaG, fimA (adhesion), as well as irp-2 gene (synthesis of iron-regulatory protein). The largest set of genetic determinants of pathogenicity was noted in clinical strains of Klebsiella spp. Cultures with DNA fragments specific to genes of E. coli pathogenicity clusters were obtained predominately from children aged up to 3 years, had multiple antibiotic resistance and were isolated significantly more frequently in severe forms of AII when compared with strains in which these determinants were not detected.

The studies performed showed that clinical strains of opportunistic bacteria isolated from patients with AII have a certain pathogenic potential, as evidenced by the presence of genetic pathogenicity markers in them.
Microorganisms isolated from reservoirs within urbanized areas, have acquired multiple antibiotic resistance, in this connection during the microbiological monitoring of water objects as an additional criterion of anthropogenic pollution it is worth to take into account indices of antibiotic resistance of bacteria. The study of heterogeneity of microbial communities of largest reservoirs in Eastern Siberia (Angara River and Lena) in terms of antibiotic resistance bacteria was performed from the positions of cluster structuredness. Opportunistic gram-negative bacteria and allochthonous representatives of microbiocenoses of the water bodies were established to be characterized by belonging to four clusters (antibiotic sensitive, mono-, moderately--and poly-antibiotic resistant). At the same time the proportion of microorganisms belonging to different clusters, vary significantly both in terms of different water bodies, and in separate parts of the same body of water, being largely dependent on anthropogenic load on water. Thus, the heterogeneity of the microbial populations permits to present comparative quantitative assessment of reservoirs, as well as their portions, in terms of antibiotic resistance of microorganisms. The increment in the proportion of resistant strains reflects the sanitary and epidemiological importance of this property, because provides evidence of the contamination of water supplies by household sewage.