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Bacterial Dysentery Monitoring and Drug Resistance Analysis

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ABSTRACT. *Objective To conduct a comprehensive analysis and research on the surveillance and drug resistance of bacillary dysentery. Methods 100 samples of bacillary dysentery collected by the Bacterial Laboratory from 2019 to 2020 were randomly selected as the research objects, and tested by biochemical identification, low serum aggregation test and drug sensitivity test, etc., to obtain a comprehensive insight into the overall culture results and drug resistance of the samples. Results There were 40 Shigella strains in the culture process, most of which were Shigella flexneri and Shigella sonnei, with 20 strains each. In the process of drug susceptibility experiments, the drug resistance of the bacteria was mainly distributed in compound trimethoprim and ampicillin drugs, and was sensitive to the indicators presented by drugs such as amoxicillin, gentamicin, and ciprofloxacin. Conclusion Bacterial dysentery infections are mainly Shigella flexneri and Shigella sonnei. One point that needs special attention in the medication phase is the resistance of the bacteria. Usually, more sensitive drugs are taken during the treatment process to enhance the treatment is effective.*

KEYWORDS: *Bacillary dysentery, Surveillance, Drug resistance*

1. Introduction

Dysentery is actually very common in daily life, mainly in developing countries. The annual number of cases worldwide exceeds 200 million, of which 5 million require hospitalization and 650,000 deaths annually. Bacterial dysentery has great harm to human intestinal health and is an infectious disease. Once people suffer from bacillary dysentery, the most obvious manifestation is diarrhea. This symptom is very harmful and difficult to control. Compared with other bacteria, bacillary dysentery is different and can cause many types of diseases. Bacterial dysentery is mostly dominated by Shigella flexneri and Shigella dysentery. This type of bacteria has strong drug resistance. If the drug sensitivity is weak in the treatment stage, the treatment effect will be greatly reduced [1]. Therefore, it is important to put in place germ monitoring and drug resistance. Randomly select 100 bacillary dysentery collected by the bacterial laboratory from 2019 to 2020 as the research object, and conduct a comprehensive analysis and research on bacillary dysentery surveillance and drug resistance. The specific report is as follows.

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2. Information and Methods

2.1 General Information

Randomly select 100 bacillary dysentery collected by the bacterial laboratory from 2019 to 2020 as the research object. During the cultivation process, there are 40 Shigella strains, most of which are Shigella flexneri and Shigella sonnei, 20 each Strain. Using the national bacillary dysentery monitoring standard as the reference basis, the drug susceptibility test of the isolated strains was carried out and specific analysis was performed.

2.2 Method

(1) Sample collection. In the collection process, it is necessary to meet the requirements of the case to ensure the standardization of stool pus, blood, mucus, and water samples. The stool volume is controlled at 1 to 5 grams. The stool sample is sent to the laboratory for inspection. Normally, the inspection time Not less than 2 hours, if it exceeds 2 hours, it must be sent to a special cultivate base for inspection.

(2) Separation and cultivation. First, streak culture. Gently dip a small amount of material from the lesion area of the specimen, streak it on the agar plate, and incubate at 37 degrees for 24 hours. Second, collect suspicious colonies, place them in a separation medium, and incubate them at 37 degrees Celsius for 16-24 hours. Carefully observe the collected suspicious colonies. The bacteria has no color, it is round and translucent, relatively smooth and moist, slightly convex, and the size is 1-2 mm; the suspicious colonies are collected and inoculated with TSI and glucose semi-solid, and the line is drawn in advance Complete the follow-up puncture, record the marking position, incubate at 34 degrees for more than 16 hours and observe the final result.

(3) Preliminary biochemical reaction. The biochemical reaction of Shigella in TSI is as follows: the color of the slope is red, the bottom is acid yellow, and no gas is produced. The color of the acid formed in the glucose semi-solid tube is yellow, no gas is produced, and no productivity.

(4) System biochemistry. Select the intestinal bacteria reagent identification strip, a total of 20 biochemical reactions in the API20E biochemical reaction system, plus a manual oxidase test, based on accurate bacterial biochemical reaction information, a series of inspection steps are carried out for the bacteria.

(5) Serum agglutination. With the successful development of Shigella immune serum, the test method was selected as the glass plate agglutination method. Based on the antigen and antibody complex electrolyte, after a period of observation, it evolves into agglomerates and can be seen with the naked eye.

(6) Drug sensitivity test. Agar disc diffusion method: The drug susceptibility test is mainly carried out by the agar disc diffusion method recommended by the Foreign Clinical Standards Committee. The drug susceptibility paper is tested by the

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domestic biological product appraisal. The drug susceptibility paper involved is: Different types of antibiotics such as ampicillin, amoxicillin/clavulanic acid, gentamicin, cephalosporin, norfloxacin, nalidixic acid, rifampicin, tetracycline and compound trimethoprim. The result evaluation refers to the evaluation standard of the drug sensitive paper of the laboratory, and the test is suitable for quality monitoring of E. coli. MIC method test: The liquid standard selected for MIC drug sensitivity test is based on McDaniel. Under normal circumstances, the concentration of antibacterial drugs is multiple dilution, and the lowest concentration that can effectively control the visible growth of the bacteria to be tested is regarded as the minimum inhibitory concentration. Quantitative testing of antibacterial drugs is mainly aimed at the in vitro activity of bacteria. A certain designated antibacterial drug detection concentration range can test the dilution breakpoint concentration of bacteria, and it also involves the MIC of the quality control reference strain.

3. Results

There are 40 Shigella strains in the cultivation process, most of which are Shigella flexneri and Shigella sonnei, with 20 strains each. In the process of drug susceptibility experiments, the drug resistance of the bacteria was mainly distributed in compound trimethoprim and ampicillin drugs, and was sensitive to the indicators presented by drugs such as amoxicillin, gentamicin, and ciprofloxacin. As shown in Table 1 and 2, they are the results of the paper diffusion method and the MIC test.

Table 1 Results of Paper Diffusion Method

Drug	Disc content	Drug resistance	Sensitivity
Compound trimethoprim	10μg	⩽12	-
Ampicillin	9μg	⩽10	-
Amoxicillin	22μg	⩽12	+
Gentamicin	9μg	⩽11	+
Ciprofloxacin	4μg	⩽9	+

Table 2 Mic Test Results

Drug	Sensitivity judgment standard	Bacteria concentration	Sensitivity
Compound trimethoprim	1.0-15.0	0.7	-
Ampicillin	0.9-3.8	0.6	-
Amoxicillin	0.9-7.7	5.2	+
Gentamicin	0.11-1.0	0.47	+
Ciprofloxacin	1.94-3.8	3.0	+

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4. Discussion

In daily life, the chance of dysentery is very high, but many people do not pay much attention to dysentery. A small number of people think this is a common disease, and some people think it is commonplace. Due to people's lack of attention, preventive measures are not in place, and the best treatment time is delayed, resulting in further expansion of the infection range of bacillary dysentery. Clinically, dysentery is divided into the following categories: First, acute typical bacillary dysentery. The dysentery is very common. Once someone is infected, symptoms such as fever, fear of cold, headache, general weakness, loss of appetite, etc. will appear. The risk index of the disease is very high. The patient will have continuous diarrhea, and even dehydration, electrolyte disorders, etc. The situation must be sent to the hospital immediately. Second, acute atypical dysentery. Compared with acute typical bacillary dysentery, acute atypical bacillary dysentery is very different. The patient’s symptoms are very similar to those of enteritis. It is easy to be mixed during diagnosis and treatment. The disease cycle can last for multiple days, and sometimes it will be cured without treatment. Again, acute toxic bacillary dysentery. This type of dysentery mostly occurs in young children, about 0-8 years old. The clinical symptoms of children include fever, diarrhea, cramps, convulsions, coma, etc. This type of disease is usually sudden symptoms, serious It will also directly cause death and seriously threaten the life safety and physical growth of young children. If you encounter such symptoms, family members must be sent to the hospital for treatment as soon as possible to steadily prevent the spread of the disease and reduce the risk. Finally, bacillary dysentery [2]. This type of dysentery is transmitted through the feces. The bacteria are slowly excreted with the patient’s feces, and then passed on to the hands, flies, food, and water. If personal hygiene is done very well, the food and drinking water are very particular. They will not be infected through this form; otherwise, they will be infected. On the other hand, the diagnosis speed of bacillary dysentery is very fast. Once it is diagnosed, the infection channel will be immediately shut off. Everything that comes into direct contact with the patient will be isolated and will not spread on a large scale.

In general, the hidden bacteria for bacillary dysentery have obvious drug resistance. After repeated drug susceptibility tests, the drug resistance of the bacteria is mainly distributed in the compound trimethoprim and ampicillin drugs. For amoxicillin the indicators presented by drugs such as gentamicin, gentamicin and ciprofloxacin are sensitive. If the sensitivity of the drugs used during the treatment is low, the treatment effect will also be greatly affected. Therefore, it is extremely critical to implement the monitoring of bacterial resistance in place [3] to enhance the effectiveness of treatment.

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