Analysis of drug resistance of Acinetobacter baumannii in burn wound infection

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Keywords: Acinetobacter baumannii, Burn wound, Drug resistance characteristics, Approach.

Abstract: Acinetobacter baumannii is a conditional pathogen, which is widely distributed in nature and can survive in hospital environment for a long time. It has the characteristics of strong survivability and resistance, high colonization rate and bacterial resistance rate. Acinetobacter baumannii is the main pathogen causing opportunistic and nosocomial infections. It is second only to Pseudomonas aeruginosa in non-fermentative bacteria. Compared with Pseudomonas aeruginosa, Acinetobacter baumannii has a more serious drug resistance situation. After extensive burns, patients destroy the skin's natural barrier, making the body lose the ability to resist bacteria, which is very easy to cause infection, and affect the survival rate of skin grafting and therapeutic effect. In order to provide some reference for clinical infection control and rational use of antimicrobial agents by clinicians, the common treatment methods of burn wound infection and the drug resistance characteristics of Acinetobacter baumannii were discussed in this paper.

1. Research background

1.1 Literature review

According to Jin Xinyuan and shelfan, burn is a common wound, and thermal burn is the most common manifestation. Normally, the occurrence of burns can not be accurately expressed by data, and estimates or sample surveys are mostly conducted in various places. Therefore, Jin Xinyuan and Xie Erfan summarized the current burn incidence rate and the number of wound infections caused by burns through relevant data analysis(Jin and Xie, 2012). Zheng Yuhong, comparing the clinical effect of burn regeneration medical technology and surgical treatment technology on preventing burn wound infection, divided 60 cases into study group and control group, and standardized systematic treatment and wound treatment. Through observation and recording, it is found that burn regenerative medical technology can effectively prevent wound infection caused by extensive and severe burn, and has a good clinical effect(Zheng, 2012). Zhang Hongsheng, through retrospective analysis of the results of bacterial culture and drug susceptibility in burn wounds, found that the resistance of pathogenic bacteria of infection caused by burn wounds has been continuously increasing, and then proposed that iminethiomycin should be used as the first choice of antibiotics against Gram-negative bacteria and positive cocci of pathogenic bacteria in burn wounds, in order to cope with the increase of drug resistance of pathogenic bacteria(Zhang, 2012). Li Ming, Wang Chao and Liu Yue et al. Starting from the drug resistance of Acinetobacter baumannii in burn wound infection, K-B method was used to test the sensitivity of Acinetobacter baumannii to antimicrobial agents. According to the relevant criteria for judging drug sensitivity, it was concluded that Acinetobacter baumannii was prone to serious cross-infection and the trend was increasing year by year, which attracted great attention from the medical community(Li et al, 2012).

1.2 Research purposes

Burn is a relatively common form of disease, which will lead to serious wound infection, which will lead to bacterial growth and endanger the lives of patients. Among them, Acinetobacter baumannii is a common bacterium that grows after burn and wound infection. Acinetobacter baumannii is a kind of conditional pathogen which strictly needs oxygen and non-lactose fermentation. It has strong vitality and widely exists in nature. However, Acinetobacter baumannii

  DOI: 10.25236/medsbe.2019.021

is an important pathogen of nosocomial infections, causing various diseases, and drug resistance is increasing year by year(Han et al, 2017). For this reason, this paper briefly summarizes some infections caused by burns, through different degrees of burn area, and then uses debridement therapy, treatment of burn wound infection and application of anti-infective drugs to solve burn wound infection treatment methods, to help burn patients to a certain extent can be timely rescued. Through the analysis of the resistance characteristics of Acinetobacter baumannii in burn wound infection, such as strong viability, strong resistance, high colonization rate and high bacterial resistance rate, it is helpful to select accurate, reasonable and effective antibiotics and avoid secondary infection and increase of drug-resistant strains in patients. It has important practical significance for grasping the epidemic law of Acinetobacter baumannii and taking timely control measures.

2. Treatment of burn wound infection

2.1 Debridement therapy for wounds

The treatment of burn wounds is the key link in the whole treatment process to prevent further infection after burn. The common treatment principle is to protect the wound and reduce exudation. First, debridement can be used. Debridement requires high conditions to ensure adequate analgesia and sedation, and to operate and perform lightly under aseptic conditions. Therefore, in the whole process of treatment, excessive scrubbing must not be allowed to increase the trauma and aggravate the pain or shock of patients. The debridement method is different according to the degree of burn. For patients with mild burns, simple debridement can be used. For example, use saline to clean the burn wound and 75% alcohol to disinfect the surrounding skin. For patients with blisters in burns, the effusion can be drained, the epidermis can be cut off, and the wound can be repaired and cleaned (Liu et al, 2012).

2.2 Dealing with burn wound infection in time

If the wound is not properly treated, it will lead to systemic infection until death. The lesion can be excised with the permission of the body for the infection of the wound. At the same time, the bacteria in burn wounds should be monitored regularly, and effective antibiotics should be selected through epidemiology and antibiotic sensitivity. Burn wound infection can lead to surface bacteria and subeschar bacteria. Therefore, when using medicine on the wound surface, we should also do a good job of subeschar bacterial firmness and drug sensitivity test. For patients with systemic infection caused by burns, blood culture and urine culture should be done to clarify the source of infection. Oxygen culture and fungal culture are necessary for burn patients of different degrees. At the same time, in order to prevent the occurrence of Acinetobacter baumannii and other similar bacteria, it is necessary to ensure the cleaning and disinfection of medical devicesAnd do a good job of regular treatment of burn wounds, change dressings, drainage and so on. When pathogenic bacteria and drug susceptibility are uncertain, antibiotics can be used for reference in the past treatment experience(Tian and Tian, 2013).

2.3 Application of anti-infective drugs

At present, the treatment of burn wound infected with Acinetobacter baumannii is still a big clinical problem. Acinetobacter baumannii is easily resistant to various disinfectants and antibiotics, which threatens the lives of patients. Usually, penicillins, third and fourth generation cephalosporins, beta-lactam antibiotics, fluoroquinolones, aminoglycosides, sulbactam and other drugs against Pseudomonas aeruginosa have strong pharmacodynamic effects on Acinetobacter baumannii. However, in recent years, the drug resistance of Acinetobacter baumannii has increased further due to the abuse of antibiotics. For example, fluoroquinolones and aminoglycosides. According to the drug resistance characteristics of Acinetobacter baumannii, the combination of drugs can be selected. Common schemes include beta-lactams + aminoglycosides, ampicillin / sulbactam + ciprofloxacin, etc. Moreover, broad-spectrum antibiotics also play a very effective role in

Acinetobacter baumannii. For example, imipenem and meropenem antibiotics have strong medicinal effects on Acinetobacter baumannii, because carbapenems have strong affinity for penicillin binding protein (PBPS).

3. Analysis of drug resistance of acinetobacter baumannii in burn wound infection

There are a large number of necrotic tissues and their secretion products on burn wounds. With the increase of capillary permeability, a large amount of extravasation of plasma-like fluid and the body temperature of burn patients make skin wounds a good medium for fungi and bacteria growth. Bacterial infection is an important cause of treatment failure or death in patients with severe burns. Therefore, infection control is still an important topic of treatment.

In recent years, Acinetobacter baumannii has attracted wide attention in medical and health circles due to its serious drug resistance and clinical susceptibility. The selective pressure caused by the extensive use of third-generation cephalosporins in hospitals has led to the increasing chances of screening and valuing multidrug-resistant Acinetobacter baumannii to a certain extent, resulting in the continuous growth of the advantages of Acinetobacter baumannii and the frequent occurrence of more serious cross-infection in hospitals, thus threatening the life safety of burn patients.

The drug resistance of Acinetobacter baumannii is mainly manifested in the following four aspects. First, Acinetobacter Bauman has a strong viability and does not need special nutritional conditions for culture. Acinetobacter baumannii can grow well at 20-30 degree. Second, Acinetobacter baumannii has strong resistance. It can survive 25d on dry body surface and has strong resistance to common chemical disinfectants and ultraviolet rays. Thirdly, the incidence of Acinetobacter baumannii colonization is high, 75% of patients can colonize, and it is also the most common Acinetobacter baumannii in the skin of medical staff. Fourthly, Acinetobacter baumannii has a high rate of bacterial resistance, which is manifested by pan-or multi-drug resistance. Among the Acinetobacter species, Acinetobacter baumannii is the most difficult drug to use, with the highest drug resistance and isolation rate in clinical specimens. Overall, the drug resistance rate of Acinetobacter baumannii showed a rising trend, and it had the characteristics of multiple drug resistance.

4. Conclusion

Due to the increasing drug resistance and isolation rate of Acinetobacter baumannii and the increasing number of pan-resistant strains, cross-infection in hospitals is becoming more and more serious. Acinetobacter baumannii widely exists in nature, human skin and hospital environment, and can cause various tissue and organ infections, such as meningitis, pneumonia, soft tissue infections and surgical wound infections. In recent years, with the increasing popularity of interventional procedures and the widespread use of broad-spectrum antibiotics in clinic, there have been multiple drug-resistant strains, which are generally resistant to a variety of antibiotics, showing an upward trend year by year, bringing severe challenges to clinical infection control. Based on this, through the analysis of the drug resistance characteristics of Acinetobacter baumannii, it is proposed to use the debridement method to treat wounds, to deal with burn wound infections in time, and to use common treatment methods such as anti-infective drugs, which has important practical significance for inhibiting the transmission of Acinetobacter baumannii and effectively controlling clinical infection.

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