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An Analysis of Microorganisms Isolated from Wound Cultures in Pediatric Cases

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Giriş ve Amaç

Günümüzde hastalıkların takip ve tedavisinde yaşanan ilerlemelere paralel olarak daha çok sayıda hasta hastanede yatarak tedavi görmektedir. Özellikle kronik hastalıkların enfeksiyon gelişimi riskini artırmaktadır. Pediatrik vakalarda yara yeri kültürlerinin üzerine literatürde fazla veri bulunamamakla birlikte yapılan çalışmada yara yeri enfeksiyonunun beklendiği üzere en sık genel cerrahi kliniğinde, 2. sıklıkta ise çocuk hastalıkları kliniğinde görüldüğü tespit edilmiştir. Bu sebeple pediatrik vakalarda yara yerinde izole edilen mikroorganizmaların bilinmesi ampirik tedavi açısından önem arz etmektedir. Bu çalışmada pediatrik vakalarda yara yeri kültürlerinden izole edilen mikroorganizmaların retrospektif olarak değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler:

Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi Hastanesi pediatri kliniğinde yatan hastalardan yara yeri enfeksiyonlarından alınmış kültür numunelerinden Tıbbi Mikrobiyoloji laboratuvarına 01.01.2016 – 31.12.2018 tarihleri arasında kabul edilen örnekler çalışmaya dahil edilmiştir. Rutin olarak kanlı agar ve EMB agara ekimler yapılarak 37 oC'de 24 saat inkübe edilmiştir. Kültürde üreyen ve etken olabileceği düşünülen mikroorganizmalar konvansiyonel yöntemlerle ve MALDI-TOF MS sistemiyle /VITEC MS sistemiyle (BioMerieux, Fransa) tanımlanmıştır.

Bulgular:

Yara kültürlerinden izole edilen 45 mikroorganizmanın 16'sı (%35,5) *Pseudomonas aeruginosa* olarak tanımlanmış, 9'u (%20) *Acinetobacter baumannii*, 6'sı (%13,3) *Candida spp.*, 5'i (%11) *Klebsiella pneumoniae*, 4'ü (%8,8) *Escherichia coli*, 4'ü (%8,8) *Staphylococcus aureus*, 1'i (%2,2) *Achromobacter denitrificans* olarak tanımlanmıştır.

Sonuç:

Sonuç olarak, yara yeri enfeksiyonlarında en sık *P. aeruginosa* ve *A. baumannii* ürediği, antibiyotik tedavisi başlarken buna dikkat edilmesi gerektiği, ayrıca mayaların da enfeksiyon etkeni olarak ihmal edilmemesi gerektiği kanaatine varılmış olup, izole edilen mikroorganizmaların merkezden merkeze farklılık gösterebileceğine dikkat çekilmek istenmiştir.

Abstract

Introduction:

Nowadays, thanks to the advancements in the follow-ups and treatments of diseases, more patients have been hospitalized. Especially chronic diseases such as cancers, increases infection risk. Although there is not much data in the literature about wound cultures in pediatric cases, it was found that wound infection has most commonly seen in the departments of general

surgery and pediatric clinics respectively, as expected. Therefore, it is essential to know the microorganisms isolated from wounds in pediatric cases in terms of empirical treatment. In this study, we aim to evaluate microorganisms isolated from wound cultures in pediatric cases retrospectively.

Materials and Methods

Specimens accepted to the Medical Microbiology laboratory from the samples taken from the wound infections in the pediatric clinic of Necmettin Erbakan University Meram Faculty of Medicine Hospital between 01.01.2016 and 31.12.2018 were included in the study. Routinely, blood agar and Eosin methylene blue (EMB) agar were cultured at 37°C for 24 hours. Microorganisms growth and thought to be active in cultures have been identified by conventional methods and MALDI-TOF MS system/VITEC MS system (BioMerieux, France).

Results

Of the 45 microorganisms isolated from wound cultures, the most frequent one was *Pseudomonas aeruginosa* with 35.5% of them (n=16). Speaking of other species, 20% were *Acinetobacter baumannii* (n=9), 13.3% were *Candida spp.*(n=6), 11% were *Klebsiella pneumoniae* (n=5), 8.8% were *Escherichia coli* (n=4), 8.8% were *Staphylococcus aureus* (n=4) and 2.2% were *Achromobacter denitrificans* (n=1).

Conclusion

Consequently, it was concluded that *P. aeruginosa* and *A. baumannii* were the most common germs growth in wound cultures. Hence this fact should be taken into consideration while starting empiric antibiotherapy to children with wound infection.

It is common information that isolated microorganisms may differentiate according to studying center and laboratories.

Keywords: *Wound culture, pediatrics, reproductive microorganisms.*

Introduction

Nowadays, thanks to the advancements in the follow-ups and treatments of diseases, more patients have been hospitalized. Especially chronic diseases such as cancers, increases infection risk. In addition to long term hospitalizations for the treatment of diseases present in many patients with chronic diseases, they also increase the risk of infection development; especially in patients with immune deficiency and/or poor general status. These infections significantly affect morbidity and mortality, too. Bacteria are often blamed as infectious agents, but also fungi and other microorganisms can be involved. Therefore, it has a great importance to know the frequency of infectious agents in patient groups in terms of follow-up and treatment. (1-3) Wound infections are important in follow-ups. Wound infections occur as a result of microorganisms settling and spreading by defeating the immune response (1-3). These infections vary greatly in terms of both the clinical picture and responsible microorganisms (4). Wound infections are one of the most common comorbid problems, especially in cases with surgery. But they are generally an important health issue in developing countries (5-6).

Although there is not much data in the literature about wound cultures in pediatric cases, it was found that wound infection has most commonly seen in the departments of general surgery and pediatric clinics respectively, as expected (7). Therefore, it is essential to know the microorganisms isolated from wounds in pediatric cases in terms of empirical treatment.

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Discussion

Defining the factors of nosocomial infections and starting appropriate empiric antibiotherapy is a crucial step of the treatment. The most important step is cultivation and antibiogram. Wound culture is also one of them. However it may not always be possible to identify the responsible agent of infection, and also sometimes treatment may be urgent and required without waiting for the culture result. Thus, it is important to know the regional infectious agents.

There are several studies investigating the site of wound infection in children. In a study, *Escherichia coli* (28.5%) was the first among the isolated microorganisms; followed by *Enterobacter aerogenes* (15.6%), *S. aureus* (14.8%) and *P. aeruginosa* (14%) (7). In a study performed in the pediatric burn unit of Şişli Etfal Training and Research Hospital, *P. aeruginosa* (%38.1) was the most common one, then *Candida spp.* (%19.0) and *S. aureus* were isolated. This was followed by *Klebsiella pneumoniae* and other microorganisms (8). In another study, *Pseudomonas aeruginosa* was most commonly isolated as wound site infections. Other factors followed this (9). In our study, *P. aeruginosa* and *A. baumannii* were isolated in more than 50% of wound cultures, and *Candida spp.* isolated.

As a result, it was concluded that *P. aeruginosa* and *A. baumannii* were most common in wound infections and proper antibiotherapy should be taken into consideration.

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| Isolated microorganisms | 2016 year n-% | 2017 year n-% | 2018 year n-% | Total n-% |
|-------------------------|------------------|------------------|------------------|--------------|
| <i>P. aeruginosa</i> | 6 - 40% | 3 - 23.07% | 7 - 41.17% | 16 - 35.5% |
| <i>A. baumannii</i> | 4 - 26.66% | - | 5 - 29.41% | 9 - 20% |
| <i>Candida spp.</i> | 2 - 13.33% | 2 - 15.38% | 2 - 11.76% | 6 - 13.3% |
| <i>K. pneumoniae</i> | 1 - 6.66% | 3 - 23.07% | 1 - 5.88% | 5 - 11% |
| <i>E. coli</i> | 1 - 6.66% | 3 - 23.07% | - | 4 - 8.8% |
| <i>S. aureus</i> | - | 2 - 15.38% | 2 - 11.76% | 4 - 8.8% |
| <i>A.denitrificans</i> | 1 - 6.66% | - | - | 1 - 2.2% |
| Total | 15 | 13 | 17 | 45 |

Table 1. The microorganisms isolated according to years.