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ORIGINAL ARTICLE
ORJİNAL ARAŞTIRMA

Yanık Çocuklarda Acinetobakter Enfeksiyonu Sonrası Klinik Süreç

Clinical progression of burned children after Acinetobacter infections

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ÖZ

Amaç: Yanık çocuklarda önemli ölüm sebeplerinden biri Acinetobakter enfksiyonudur. Bu çalışmada, merkezimizdeki Acinetobakter enfeksiyonunun ihtimal sebeplerini araştırdık. Ayrıca başka merkezlerden merkezimize enfeksiyonun yayılma sebeplerini de bulmaya çalıştık.

Materyal ve metod: Yanık hastalarının klinik seyirlerini incelerken, yara ve kandaki A. Baumanii varlığı araştırıldı.Ağustos 2011 ile Mayıs 2014 arasındaki dosyalar yaş, yanık yüzdesi,yatış günü, yanık sebebi, nereden sevk alındığı, enfeksiyon varlık süresi, kültür tipleri, antibiyotikler, ölüm ve taburcular incelendi.İstatistiki olarak sonuçlar incelendi($p<0.05$).

Sonuçlar: Klinik süreçte yanık sebebinin ve acinetobakter varlık süresinin belirgin farklılık gösterdii bulundu($p=0.024$).Yanık yüzdesi ile de enfeksiyon varlığı körele idi($p=0.011$).Kültür bulguları iyileşmeyi etkiliyordu($p=0.047$).

Tartışma: Yanık sebepleri, yatış günleri ve kültür bulguları acinetobakter ile enfekte olan yanık çocuklar için önemlidir. Bahsedilen bu verilerin varlığına dikkat edilmelidir. Tedbirler alınmazsa ölüm görülebilir.Literatürde bu risk parametreleri yoktur. Bu yüzden çalışmamız literatüre katkıda bulunmaktadır.

Anahtar Kelimeler: yanık; çocuk; yoğun bakım; asinetobakter

ABSTRACT

Aim: One of the mortality causes for burned children is Acinetobacter infection. In this study, we aimed to investigate the possible causes of Acinetobacter infections in our burn centre. We also investigated the possibility reasons of the spread from other centres to our burn unit.

Material and Methods: During the evaluation of clinical course of burned patients, presence of Acinetobacter baumannii infections were also investigated in wound and blood cultures. Archives from August 2011 to May 2014 were evaluated for ages, percentages, hospitalization days, reasons of burns, transferring centres, infection existence time, culture types, antibiotics, exitus and discharges. Results were evaluated statistically ($p<0.05$).

Results: Reasons of burns and time of acinetobacter existence were significantly different in the clinical course ($p=0.024$). Also, the existence of acinetobacter infections was correlated with increase in burn percentage ($p=0.011$). Finally, culture findings about Acinetobacter infections affect remissions ($p=0.047$).

Conclusion: Reasons of burns, hospitalization days and culture findings are very important for burned children infected with acinetobacter. Clinicians must be cautious in these aforementioned situations. Death may be seen if not precautions are taken. Literature is lacking on risk parameters, therefore our study will have an additive affect to literature in this subject.

Keywords: Burn; Children; Intensive; Care; Acinetobacter

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Introduction

Microbial colonization begins at the very beginning of the burn event with common and epidemic microorganisms. Among these, Acinetobacter is relatively a new determined microorganism (1, 2). It has a very high mortality and morbidity affect. Acinetobacter may cause infections in different tissues like sepsis, pneumonia, endocarditis, meningitis, dermal and burn locations (1-3). The bacteria mostly originate from outdoors to spread in intensive care and burn units (2, 4, 5). Nevertheless, long period intensive care hospitalizations, surgery, central catheterizations, tracheostomy, mechanic ventilation, enteral nutrition, are some other risk factors of Acinetobacter infections (3,4, 6, 7). The mechanism of death after Acinetobacter infections is not clear. The severity of the clinical problems or Acinetobacter itself may be responsible for this dramatic result (8). In our study, we tried to determine the clinical circumstances of Acinetobacter infections that stimulates the mortal process, and aimed to compile the reasons if these outputs might be interpreted as risk factors of these infections. Literature limitation is a certain problem to find out definite results. Also, shortage of incidents may limit the impression of our comments.

Material and Method:

Patients admitted to our hospital between August 2011 and May 2014 were investigated for *Acinetobacter baumannii* infections. Patients with positive wound and blood results of the bacteria were included in further evaluations. Ages, burns percentages, hospitalization days, reasons for burns, transferring centres, days of initiation, cultures, antibiotherapy, mortality and discharged patients were evaluated. Statistics and results were discussed with literature.

Results

Twenty-eight patients were investigated. Median ages, median hospitalization days and burn reasons were shown in Table-1. Transfer centres, median hospitalization days and types of cultures were shown in Table-2. Antibiotherapy, days of Acinetobacter infections detected by clinical evaluations and laboratory investigations for Acinetobacter were shown in Table-3. Burn reasons, clinical period of Acinetobacter treatment and burn percentages with Acinetobacter infections were analysed statistically with one-way ANOVA. All tables were based on burn percentages.

Table-1: Features of the burnt patients

% Burn/Parameters	No. Patients	Median Age	Median Hosp.	Water	Flame	Hot Material
1-19%	1	8	16	1	0	0
20-39%	8	5	26	2	4	2
40-59%	10	4	61	3	5	2
60- %	9	11	67	1	5	3

Hosp.: Hospitalization

Table-2:Burnt patients with transferring features, infection timing and types of specimen

% Burn /Parameters	Upstate	Urban	Inf. After admi.	Pus	Blood	Other
1-19%	0	1	7	1	0	0
20-39%	4	4	16	8	0	0
40-59%	6	4	10	5	2	3
60- %	5	5	7	4	3	3

Inf. After Adm.: Infections after admission

Burn reasons with Acinetobacter infections were statistically significant (p=0.024), and flame was the most seen reason. Increase in burn percentages and Acinetobacter infections were correlated (p=0.011). Also, patients with increasing burn percentage were effected with the prolonged Acinetobacter days. Group 1-19% had median 2 days of infection period, group 20-39% had median 6 days of infection period, 40-59% had median 38 days of infection period and 60% had median 58 days of infection period. Culture negative patients

had significant statistically akin to culture positive patients according to remission days (p=0.047). Mann-Whitney U was used to evaluate these parameters.

Discussion

In spite of all precautions, infections are one of the most reasons of death in intensive care units (2, 3). Acinetobacter infections are remarkable in the group of major complications. It is an opportunistic pathogen (1). Acinetobacteria can survive easily in hospital circumstances for long periods, and in addition, clearance of the bacteria from the environment is nearly impossible (1,9). Acinetobacteria baumanii is the well-known type (2). A.baumanii can also spread from other patients (1). Infection can be detected with respiratory system, urinary tract, surgical wound, burns, dermis and eye (1, 2, 10). Also, bacteraemia and meningitis might be seen with A. baumanii (1,2,10). A. baumannii is resistant to almost all antimicrobial drugs (2, 11). In some hospitals the incidence of A. baumanii is 1.8 in 1000, and the incidence is higher in intensive care units (10). In some burn units; it is as high as 7.4% (8). For our burn unit, the incidence is 5.6%.

Some risk factors for Acinetobacter have been defined (2). Some of these factors are; central venous catheterization, broad-spectrum antibiotics, mechanical ventilation, surgery, immunosuppression, disorganized patient hospitalizations, septicaemia, hydrotherapy and pulsatile lavage therapies (2, 3). All these factors may cause death (2,3).

In our study, other than the aforementioned reasons, main risk factors are reasons of burns, percentages and prolongation of microbiological remissions were found to be possible effective risk factors of acinetobacter infections.

Impact time for acinetobacter infections differs according to the reasons of burns. This parameter is not sufficiently evaluated in literature. Flame and hot material burns had longer infection periods that may cause acinetobacter infections comparing to hot water burns.

Correlation of burn percentage and acinetobacter infection is also lacking in literature. Acinetobacter species survived with the increase in the burn percentages. That is, in mild burn percentages Acinetobacter is eliminated in 2 days time but in large burn percentages, Acinetobacter is detected long time as 58 days. Six (21%) patients died because of Acinetobacter . Two of them had 40-59% burn area, and 4 of them had 60 and more% burn area. Patients' median hospitalization days were 37 days.

Some of the patients were clinically negative for acinetobacter infections although microbiologic laboratory evaluations had shown acinetobacter. Therefore, diagnose of Acinetobacter infection is not easy. But if infection occurs, acinetobacteria had 7-52% mortality (1,3,10, 12). For this reason, negative culture examinations after antibiotherapy of the patients were also investigated for the included patients. In our series, 10 patients had no culture-negative specimens in routine evaluations. One of them died and 9 were discharged from hospital. In total, 6 patients died, and 22 were discharged. So, patients with culture positive patients might not be a vital factor for clinical assessment and evaluating the patients in standard protocols might be sufficient in this point of view.

Another risk factor for the existence of the microorganism in a unit is the transferring of patients from unit to another one (2). So, spreading of the infection can easily be maintained. Data on this subject is not sufficient and statistical is not evaluated.

However, we know that colonization of acinetobacter consisted the largest part of patients in some other hospitals (13). 50% of these patients might be grouped as in this mechanism of infections (13). Therefore, transfer types were also evaluated for our patients. 16 patients were transferred from other hospitals. 4 of them died. There were no significant difference for statistical evaluation on long lasting acinetobacter infection and death.

The infection might occur at the fourth day of admissions to intensive care unit (8). If colonization was not present, the infection might be seen after 17 days average (8). Risk for acinetobacter infections were higher in patients that were hospitalized more than 90 days (7). In our series, average admission days for the infection was 10. This finding is statistically insignificant.

Treatment of the acinetobacter infections is difficult because the microorganism has drug resistance (1). Acinetobacter is usually resistant to the drugs like aminopenisilin, cephalosporin and chloramphenicol (2). Therefore, Polymyxin B (Colistine) is the drug mostly chosen for treatments (11). Mechanism of Polymyxin B is not completely understood but the drug degrades the cell wall by detergent effect (11). Polymyxin B makes nephrotoxic, neurotoxic and neuromuscular blockade. In our study, treatment differences were not evaluated. Nevertheless, Polymyxin B was used for the treatment according to the culture findings. Reversible nephrotoxic and neurotoxic sequels were detected in our patients. Neuromuscular blockade was not seen.

Conclusion

Successful treatments of the Acinetobacter infections depend on finding out the starting point of the microorganism, and performing an aggressive cleaning program. This may occur with surgical procedures or without surgical procedures. Clinical progresses must be carefully taken into account. Monitoring the clinical process will strongly effect the remission of the infection.

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