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Efficacy of Antimicrobial Prophylaxis during General Surgery Using Epidural Anesthesia

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INTRODUCTION

In recent years a shift in current anesthesia practice has been observed from general anesthesia to regional anesthesia using local anesthetic drugs. Epidural anesthesia-analgesia is one of the most frequently used types of regional anesthesia combining several advantages but one potential disadvantage: the risk of bacterial contamination of the epidural catheter and localized infection leading to infection of the central nervous system (CNS) or systemic infection.

AIM

In order to evaluate the effectiveness of antimicrobial prophylaxis during surgical procedures on patients receiving lumbar epidural anesthesia, the incidence of bacterial contamination of epidural catheters as well as local and systemic infections was investigated.

METHODS

This prospective study took place at the Aretaio Hospital, Athens over a period of 18 months. 85 adult patients who received anesthesia via epidural catheters inserted at the lumbar site (O_1 - O_4), were monitored during and after surgical procedures. Antimicrobial prophylactics were selected in accordance with the type of surgical procedure undertaken and administered in the following manner: one IV dose just before the beginning of anesthesia, a subsequent dose after 8 hours and a final dose after another 8 hours. Apart from type of antimicrobial prophylaxis data such as age, sex, type of surgery, maximum body temperature, duration of catheter placement and species of microorganisms isolated from the tip of each catheters, were recorded on a spreadsheet and subsequently evaluated statistically.

RESULTS

32 men aged 59.94 ± 2.12 yrs and 53 women aged 50.85 ± 2.33 yrs took part in the study. Of the 85 surgical procedures monitored, gynecological operations were by far the most common (31.8%) followed by vascular (22.4%) and obstetric (18.8%) operations. The majority of patients received cephalosporin derivatives (61.8%) as prophylactic agents followed by penicillin derivatives (13.2%) and only 9 of the 85 patients (10.6%) did not receive any kind of antimicrobial prophylaxis.

All epidural catheters remained in place for 2.91±0.19 days (range: 0.13 to 12 days) i.e. 2.57 ±0.29 days for the men and 3.12 ± 0.24 days for

the women. The mean maximum body temperature observed was 37.34 ± 0.06 °C (range: 36.50 - 39.60 °C) i.e. 37.31 ± 0.09 °C for the men and 37.35 ± 0.09 °C for the women.

Microbiological analysis of the 85 epidural catheters showed that only a relatively small percentage (28.2%) provided positive cultures. Of these, only 2 were polymicrobic (*Enterococcus agglomerans* and *Staphylococcus haemolyticus* or *hominis*) while the remainder were due to a single microorganism. The most prevalent microorganism was *Staphylococcus epidermidis* (58.3%), which was isolated, in particular, in those patients who had undergone gynecological operations (62.5%). No infection of the central nervous system or systemic infection was observed during the study. No statistical correlation was found between the administration of prophylactic agents prior to and during surgical procedures and the incidence of positive catheter cultures.

CONCLUSIONS

In the present study the percentage of bacterially contaminated catheters observed was independent of the administration of antimicrobial agents. Neither our period of epidural catheterization (approx. 3 days) nor the maximum observed body temperature showed any significant statistical correlation with respect to the incidence of positive cultures. It appears that the use of excellent aseptic techniques before, during and after the placement of an epidural catheter may significantly diminish their bacterial contamination.