

THE PREANALYTICAL OPTIMIZATION OF BLOOD CULTURES: CRITICAL ROLE OF THE MICROBIOLOGY LABORATORY

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INTRODUZIONE

Bloodstream infections remain a major challenge in medicine. Optimal detection of pathogens is possible only if the quality of preanalytical factors is thoroughly controlled. Appropriate managing of the factors that affect the preanalytic phase of blood culture (BC) significantly contributes to the generation of important culture results that ultimately affect patient diagnosis and management. The laboratory is "out-box", but it has the difficult task of implementing control strategies to optimize the pre-analytical phase.

The aim of this study was to evaluate current practices regarding the pre-analytical phases of BCs, in different departments of our hospital.

METODI

Between January and June 2015, 1130 requests for BC were examined. The patients were hospitalized in the intensive care unit, general medicine, hematology, nephrology, geriatrics and infectious disease wards. For each request of BCs, the correct execution of some determinants that ultimately affect patient diagnosis and management was evaluated. In particular, we have examined some important points: 1) number of blood culture sets performed during a given septic episode, 2) draw blood for culture before initiating antimicrobial therapy, 3) contaminated blood culture bottles.

RISULTATI

In this study, we found that the most common mistake is the number of BC sets performed, in particular the error rate is equal to 65,1% in intensive care unit, 80% in infectious disease ward, 40% in hematology ward, 33,7% in geriatrics ward, 26,7% in nephrology and transplant ward; instead it is very low in general medicine (2%). Regarding to blood cultures contaminated with skin flora during collection the error rate is equal to 8% in infectious disease ward, 5,4% in geriatrics ward, 5,8% in nephrology ward and 14,5% in intensive care unit. In general medicine and hematology ward the contamination rate does not exceed 3%, according to consensus guidelines. In all departments the samples are taken before the beginning of antimicrobial therapy.

CONCLUSIONI

In this study, two very critical factors have emerged: number of BCs performed and BCs contaminated with skin flora in wards that need a fast and reliable diagnosis. Our results highlight the importance of microbiology laboratory in identifying critical points through monitoring of the pre-analytical phase, and promoting strategies to optimize this stage, essential in providing optimal care of patients and reducing financial burden. Clear recommendations for standardized blood culture collection combined with quality control of critical factors of the preanalytical phase are essential for diagnostic blood culture improvement.

The critical role of the microbiology laboratory in infectious disease diagnosis calls for a close, positive working relationship between the physician and the microbiologist who provide enormous value to the health care team.