STERILE FLUIDS IN BLOOD CULTURE BOTTLES

Whenever the subject of blood culture is discussed, the intended sample type used is always related to blood sample fully. However, we need to also be aware that other than blood sample, sterile fluids can also be inoculated as sample for blood culture testing. Among the sterile fluids that are commonly known are peritoneal, pleural, synovial, cerebrospinal, pericardial, amniotic etc. [1]

The presence of microorganism recovered from sterile fluids is potentially life-threatening specifically for the case of meningitis, pericarditis, peritonitis, septic arthritis and empyema.[2] Therefore, it is of paramount importance to be able to get recovery and identification of such microorganisms so that early treatment can be initiated.

Customarily in the laboratory workflow, sterile fluid is routinely cultured onto solid culture medium (chocolate agar and blood agar for cerebrospinal fluid, aerobic and anaerobic media for peritoneal fluid) or more preferably with an enrichment broth medium.[2] More often than not, the solid culture might take up to 30 days to recover the microorganism eg: *Brucella melitensis*. Not only that, there are also additional challenges of microorganism recovery in sterile fluids which [1]:

a. Low number of microorganism even though with large volume of specimens;

b. Low volume of sample eg: CSF and synovial fluids;
c. Initiation of antibiotic therapy before collection of sample which lead to the false negative results;
d. Fastidious organisms may be missed if proper media or supplements are not incorporated into the culture method;
e. Contaminant microorganisms may overgrow potential pathogens;
f. Delay in transport of the specimen to the microbiology laboratory may result in decreased recovery.

The use of blood culture system for culture of normal sterile fluid is gaining increasing acceptance. Based on a study using BACTEC 9240 Blood Culture System to detect *Brucella melitensis* in synovial fluid, it is able to recover 3 of 14 positive cultures (21.4%) by day 3, 7 of 14 positive cultures (50%) by day 4, 12 of 14 positive cultures (85.7%) by day 5 and all 14 positive cultures (100%) by day 7 [3]. Another study did by F.Z Akcam et. al., 2006 using BACTEC blood culture system, 139 (15.3%) of 906 specimens were isolated by both the BACTEC blood culture system and conventional culture, whereas 80 (8.8%) specimens were isolated by BACTEC blood culture system only. In another word, BACTEC blood culture system is able to increase isolation of bacteria undetectable by conventional method by 8.8% [2].

In conclusion, blood culture is one way to detect bacterial infection in sterile fluid sample by with higher sensitivity. By using BACTEC blood culture, studies have proven that it is able to handle the challenges faced by conventional method.
REFERENCES

