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RAPID BEDSIDE DIAGNOSIS OF BACTERIAL MENINGITIS

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Background: Hospital acquired infections (HAI)/nosocomial infections affect >20% of patients in intensive care units and have a high associated mortality rate of >30%. Patients receiving neurosurgical intensive care are exposed to several risk factors like multiple trauma, altered consciousness, impaired protective reflexes etc., for acquisition of nosocomial infections which can be presented as pneumonia, urinary tract infection, meningitis etc. Nosocomial meningitis is mainly seen in neurosurgical patients. Due to anatomical restrictions, the inflammatory response to intracranial bacterial infections exposes swollen brain tissues to pressure and ischemia, in a life-threatening condition. Rapid diagnosis and immediate empirical antibiotic therapy is highly important. However, diagnosing meningitis in patients after neurosurgical procedures is complicated, due to brain tissue damage and changes in cerebrospinal fluid (CSF) caused by surgery. Moreover, altered consciousness can make it difficult to establish a diagnosis in patients on ventilators that develop fever after neurosurgical operations. Neutrophils are important members of innate immunity that are activated by microbes. Neutrophils can kill pathogens extracellularly by releasing neutrophil extracellular traps (NETs) that are composed of chromatin bound to selected cytoplasmic proteins.

Materials & Methods: Chromatin has a high affinity to aniline dyes. Based on metachromatic staining's principle, we prepared simple and rapid tests that detected presence of NETs by immediate interaction to chromatin in CSF. CSF from neurosurgical patients that developed fever post-operatively were analyzed with the test and the results were compared with conventional diagnostic methods.

Results: CSF samples (n=163) were collected consecutively from patients. A positive CSF culture was chosen as golden standard. The results showed that the test detected culture positive bacterial meningitis with 100% sensitivity, 74.7% specificity and negative predictive value 100%.

Conclusion: The rapid test might be a valuable tool to detect bacterial meningitis immediately after lumbar puncture in patients with suspected infection

Biography

Amir Ramezani studied medicine at Karolinska institute Sweden 1988-1993, recieved his Medical degree. 1993. He has done his residency in neurosurgery in Linköping university hospital and become specialist in neurusurgery 2004. Work at the moment as consultant neurosurgeon and head of spinal unit in Linköping university hospital in Sweden and PhD student at Linköping university since 2016.

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