Meningitis-associated low molecular mass proteins in cerebrospinal fluid

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Recent investigations show that a great deal of effort is being put to develop a specific test which could be effectively used to diagnose meningitis and which could also be helpful in differential diagnosis of infectious diseases of the central nervous system [1-3]. In this context several constituent proteins of cerebrospinal fluid (CSF) have been evaluated to establish their possible correlation with bacterial meningitis [1, 4, 5]. We previously evaluated the use of ultra-thin-layer SDS/PAGE as a rapid method to analyse CSF proteins, as qualitative changes occurring in these might be of some value in the diagnosis of bacterial meningitis [6]. In this communication we report the presence of two low molecular mass proteins which appear to be specific for bacterial meningitis.

CSF samples from 112 patients with bacterial meningitis were examined by ultra-thin-layer SDS/PAGE using the procedure described elsewhere [6]. The total protein concentration in this disease is inconsistently raised, thus making it a highly unreliable parameter for diagnostic purposes. When these CSF samples were analysed by SDS/PAGE (Fig. 1a) they showed a consistent pattern of protein bands despite the fact that their total protein concentrations were not comparable in many cases. In addition to the protein bands present at M, 66000, 55000 and 25000 which seemed to be the common feature of CSF samples, the most noticeable finding was the presence of two low molecular mass protein species at approximate M, 12000 and 15000. In 91 out of 112 samples of bacterial meningitis these protein bands were clearly visible. The same combination of these two bands was not detected in the CSF sample of viral meningitis and other disorders of the nervous system.

To further investigate whether these proteins exist as monomeric proteins or are subunits of each other, the same samples were also subjected to PAGE in the absence of detergent and reducing agent. Fig. 1(b) shows the electrophoretic profiles of CSF proteins from individuals with bacterial meningitis. On this system, those low molecular mass protein bands were not present. Instead, a single band at approximate M, 30000 was present which could possibly be a dimer of the two low molecular mass proteins described earlier on SDS-gels. Attempts are now being made to establish the physicochemical characteristics of these proteins.

Our results show that the specificity of these low molecular mass proteins was 81%, which could possibly place these proteins which appear to be specific for bacterial meningitis as reliable indicators of bacterial meningitis. The use of ultra-thin-layer PAGE to detect these proteins makes them even more promising candidates since this particular method is reasonably sensitive and rapid. As a correct and early diagnosis is a prerequisite for the optimal treatment of meningitis, these findings may fulfill this essential requirement.

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Isolation of low molecular mass proteins from renal stones

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Abbreviation used: THM, Tamm-Horsfall mucoproteins.

Incidence of renal stone formation are fairly common in areas of hot climatic conditions like the Asian subcontinent and the Middle East. Current theories suggest that some inhibitors and promoters of stone formation present in urine may play a key role in the prevention and formation of stones [1, 2]. A disturbance in the ratio between promoters and inhibitors might therefore be the cause of stone formation in