LETTER TO THE EDITOR

Neuropsychological sequelae of bacterial meningitis: the influence of alcoholism and adjunctive dexamethasone therapy

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The article by Schmidt and colleagues (2006) reported neuropsychological sequelae of bacterial and viral meningitis. In a retrospective study, they carefully selected patients and excluded those with concomitant conditions such as alcoholism after *Streptococcus pneumoniae* meningitis (Schmidt *et al.*, 2006). The authors should be complimented for their solid work; however, some questions can be raised.

First, their analysis did not show relevant differences between patients after *S. pneumoniae* and *Neisseria meningitidis*. This is discordant with findings of a previous prospective study on cognitive outcome of patients with good recovery after bacterial meningitis (van de Beek *et al.*, 2002). The authors explain this discrepancy by the assumption that results of this previous study have been biased by inclusion of patients after pneumococcal meningitis with alcoholism. Alcoholism is a predisposing factor for pneumococcal infection and may have influenced cognitive test results. In this previous study patients were recruited from a prospective nationwide study on 696 adults with community-acquired bacterial meningitis (van de Beek *et al.*, 2004). A total of 352 patients with pneumococcal meningitis were included in this cohort; 19 patients (6%) had a history of alcoholism; distribution of the patients with pneumococcal meningitis and alcoholism in this cohort stratified for Glasgow outcome scale is shown in the Table 1. In the group with a score of five on the Glasgow outcome scale the proportion patients with alcoholism is relatively low (2%); patients with pre-existing psychiatric disorders were excluded from the neuropsychological evaluation. None of 26 patients after pneumococcal meningitis who were included in the neuropsychological evaluation had a history of alcoholism. So, differences in findings between the study of Schmidt *et al.* and our prospective study cannot be explained by the inclusion of patients with alcoholism. A more likely explanation for the absence of neuropsychological differences in the Schmidt *et al.* study is lack of statistical power for the comparison of *S. pneumoniae* and *N. meningitidis*. They only had 16 patients in each subgroup. Other factors that might explain this result are differences in time since the disease or in the proportion of patients with GOS score <5.

Table 1 Distribution of patients after pneumococcal meningitis with a history of alcoholism in the Dutch Meningitis Cohort Study, stratified for score on Glasgow outcome scale

Score on Glasgow outcome scale	Patients with known history of alcoholism/number for each outcome group (%)*
1—dead	7/105 (7)
2—vegetative state	0/3 (–)
3—severely disabled	3/17 (18)
4—moderately disabled	5/50 (10)
5—good recovery	4/170 (2)

*Item 'history of alcoholism' was scored 345 out of 352 patients (98%) with pneumococcal meningitis included in the Dutch Meningitis Cohort Study.

Secondly, what proportion of patients with bacterial meningitis included in the study of Schmidt received adjunctive treatment with dexamethasone, or other corticosteroids, during the clinical course? A recent randomized, placebo-controlled trial showed that adjunctive treatment with dexamethasone before or with the first dose of antimicrobial therapy reduced the risk of unfavourable outcome from 25 to 15% (de Gans and van de Beek, 2002). A quantitative review of this topic showed a beneficial effect on neurological sequelae as well (van de Beek *et al.*, 2004). Ever since, dexamethasone has become routine therapy in patients with suspected bacterial meningitis (Tunkel *et al.*, 2004; van de Beek *et al.*, 2006). Corticosteroids may potentiate ischaemic injury to neurons. In infant rats with pneumococcal meningitis, adjunctive dexamethasone increased hippocampal cell injury and thereby aggravated learning deficiencies (Nau and Bruck, 2002). In other animal studies, the effects of dexamethasone are diverse and conflicting due to induction of apoptosis, interference with trophic support, and learning process (Irazuzta *et al.*, 2005). Therefore, it is important to evaluate whether steroid therapy prevents death but worsens cognitive functioning in patients with bacterial meningitis.

Finally, Schmidt and colleagues clearly found abnormal test results on the visuo-constructive functions (i.e. Rey figure copy). This finding is highly comparable with our previous studies (van de Beek *et al.*, 2002; Weisfelt *et al.*, 2005). One could postulate that this finding suggests dysfunction of the parietal lobes (e.g. Lezak *et al.*, 2004), although another explanation may be impairment of executive function. Did the authors find a relation between worse scores on the Rey figure copy and atrophy of parietal lobes?

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