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Original article

Is there any benefit from short-term perioperative antiepileptic prophylaxis in patients with chronic subdural haematoma? A retrospective controlled study

Une prophylaxie antiépileptique péri-opératoire apporte-t-elle un bénéfice dans la prise en charge des hématomes sous-duraux chroniques ? Une étude rétrospective contrôlée

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ABSTRACT

Background. – Chronic subdural haematoma is a common pathology, which can be complicated by seizures. Seizures may worsen the outcome of patients presenting with a chronic subdural haematoma. However, since the overall and postoperative incidence of seizures and their impact on patients' outcome has been diversely appreciated in the literature, the interest of routine antiepileptic prophylaxis remains a controversial question.
Methods. – We retrospectively investigated 99 patients who were surgically treated for a chronic subdural haematoma in two French academic hospitals: 48 patients received antiepileptic prophylaxis (group A) and were compared with a group of 51 patients who did not receive any antiepileptic prophylaxis (group B). Incidence of perioperative seizures was determined, and potential risk factors for epilepsy were analysed.
Results. – Overall postoperative seizure incidence was 5.1%. There was a slight trend towards a lower incidence of seizures in patients who had received antiepileptic prophylaxis, but no significant difference was found between the two groups (4.2% in group A versus 5.9% in group B, $P = 0.697$). Seizures were not correlated with increased death. No risk factor for seizures was identified.
Conclusions. – Our retrospective data showed there is no benefit of perioperative antiepileptic prophylaxis in patients surgically treated for chronic subdural haematoma. Since other authors have shown conflicting results, sufficiently powered prospective randomized study should be conducted in order to confirm these results.

Mots clés :
Épilepsie
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Devenir
Chirurgie
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RÉSUMÉ

Contexte. – Les hématomes sous-duraux chroniques sont une pathologie fréquente, souvent associés à la survenue de crises d'épilepsie. Ces dernières peuvent aggraver le pronostic des patients. L'incidence et l'impact des crises d'épilepsie restant diversement appréciés dans la littérature, l'intérêt d'une prophylaxie antiépileptique systématique demeure controversé.
Patients et méthodes. – Nous avons étudié rétrospectivement 99 patients traités pour un hématome sous-dural chronique dans les hôpitaux universitaires de Marseille et Toulouse. Quarante-huit patients ont reçu une prophylaxie antiépileptique (groupe A) et 51 n'en ont pas bénéficié (groupe B). Nous avons déterminé l'incidence des crises en période péri-opératoire et les facteurs de risque de présenter une crise d'épilepsie.

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Résultats. – L'incidence globale des crises d'épilepsie post-opératoires était de 5,1 %. Une discrète tendance à une incidence plus basse était notée chez les patients ayant reçu une prophylaxie antiépileptique, sans différence statistiquement significative entre les deux groupes (4,2 % dans le groupe A, 5,9 % dans le groupe B ; $p = 0{,}697$). La survenue de crise n'a pas été corrélée à une élévation de la mortalité et aucun facteur de risque de faire des crises n'a été identifié.
Conclusion. – Notre étude ne montre pas de bénéfice d'une prophylaxie antiépileptique chez les patients opérés d'un hématome sous-dural chronique. Une étude prospective et randomisée est nécessaire pour confirmer ces résultats.

1. Introduction

Chronic subdural haematoma (CSH) has an estimated incidence of 8 to 58 per 100,000 people per year in the elderly population (>65 years). As the population is getting older, neurosurgeons should be prepared to manage an increasing number of CSH [1]. Epilepsy has been reported as a classical complication of CSH [1–3]. The incidence of seizures in patients surgically treated for CSH has not been well established, though it has been estimated to be in the range of 2.3–17% [4,5]. A previously reported review questioned the role of antiepileptic prophylaxis (AEP) to prevent seizures in this patient population [6]. However, no prospective data was identified, and retrospective data have shown conflicting results. Therefore, the question of the routine use of AEP in CSH remains an issue. In the present study, we examined the respective incidence of seizures in two groups of surgically treated CSH patients who received or did not receive routine AEP. We also attempted to identify predictive factors associated with the development of seizures in CSH.

2. Methods and materials

2.1. Patient population

We conducted a retrospective bi-centre study in two French academic centres of reference for the care of neurotrauma (i.e., Marseille and Toulouse-Rangueil). The two centres are quantitatively and qualitatively similar as regards the number of beds and the number of interventions per year for CSH.

The medical charts of 124 consecutive patients who underwent surgery for subdural haematoma in Marseille and Toulouse from January to December 2011 were reviewed. Twenty-five patients with acute subdural haematoma, personal history of epilepsy, or previous antiepileptic treatment were not included in the study. All patients had to undergo one preoperative CT scan and at least another scan during the early postoperative period that would be available for analysis. Mass effect on cortical structures was present in all cases on preoperative CT scan. Midline shift varied according to the volume of the haematoma and the volume of the cerebrum, but they were not measured specifically. Only one case of compressive postoperative pneumencephalus was observed.

In all, 99 patients were finally included in the study. The patient population characteristics are summarized in Table 1. The 48 patients who were treated in Marseille had routine antiepileptic prophylaxis (group A), whereas the 51 patients who were treated in Toulouse did not receive any antiepileptic prophylaxis (group B). The 2 groups were similar as regards the preoperative parameters, except for confusion ($P = 0.021$) and headache ($P = 0.008$) that were more frequent in group A. In group A, 33 patients (68.7%) presented with an unilateral CSH and 15 patients (31.3%) with bilateral CSH, while in group B, 41 patients (80.4%) had unilateral CSH and 10 patients bilateral CSH (19.6%).

Basic biological parameters were collected at the time of admission, whose lower values were defined as follows: platelet count (<150,000/mm^3), haemoglobin (<12 g/dL), low prothrombin index (<70%), serum sodium (<135 mmol/L), serum calcium (<2.2 mmol/L) and glycaemia (<3.6 mmol/L).

Table 1
Patient population characteristics.
Caractéristiques de notre population de patients.

	Group A ($n = 48$)	Group B ($n = 51$)	*P*-value
Clinical presentation at admission			
Sex M/F	34/14	30/21	0.21
Age (mean)	74.27	77.02	0.28
Confusion	30	20	**0.02**
Motor or speech alteration	30	31	0.86
Headache	15	5	**0.008**
Glasgow scale <15	23	24	0.93
Factors influencing occurrence of SDH			
History of shunt	0	0	NS
Anticoagulant	7	10	0.51
Antithrombotic use	14	11	0.38
Low platelets count	6	2	0.15
Prothrombin time <70%	6	9	0.45
Factors influencing occurrence of seizures			
History of stroke, SAH, AD, MS or severe head trauma	5	3	0.48
Treatments increasing seizure threshold[a]	14	15	0.98
Treatments decreasing seizure threshold[b]	10	14	0.44
Glycaemia (mean)	6.7	5.723	0.37
Factors influencing occurrence of seizures and SDH			
Alcohol abuse	6	3	0.31
Recent head trauma (minor)	31	34	0.827
Low serum calcium	6	4	0.36
Low serum sodium	7	5	0.47

SAH: subarachnoid haemorrhage; AD: Alzheimer's disease, MS: multiple sclerosis. In bold: statistically significant (*P*-value < 0.05).

[a] Treatments that may have protected patients against seizures: benzodiazepines, loop diuretics, thiazide diuretics.

[b] Treatments that may have favoured seizures: neuroleptics, antidepressant, analgesics (tramadol, nefopam chlorydrate), anticholinesterase agents (rivastigmine, donepezil).

2.2. Surgical management

The majority of the patients underwent general anaesthesia ($n = 43$ [89%] in group A and $n = 41$ [80%] in group B), while few patients underwent local anaesthesia ($n = 5$ [11%] in group A; $n = 10$ [20%] in group B). Surgical technique consisted of trephination or burr-hole with subdural drainage that was withdrawn two or three days after surgery. Trephination was performed in 31 patients included in group A and in 43 patients belonging to group B ($P = 0.024$), whereas a burr-hole was performed in 17 patients from group A and 8 patients from group B. The opening of the medial capsule of the CSH has rarely been mentioned in operative reports; interviews with the surgeons indicated that it was rarely performed. The patients were kept in a supine position during two days after surgery with monitoring of electrolytic status.