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Neuraxial blocks and spinal haematoma: Review of 166 cases published 1994 – 2015. Part 2: diagnosis, treatment, and outcome

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HIGHLIGHTS

- 166 case reports of spinal haematoma (SH) after neuraxial block (CNB) are analysed.
- Most often, the signs of a SH started within 72 h, though in some cases after weeks.
- Surgical evacuation of the SH is best option in most cases with neurological deficits.
- A conservative approach can be employed in cases with mild or receding symptoms.
- Best results are seen in patients surgically evacuated within 12 hours
- Complete recoveries occurred in many cases operated after more than 24 hours.
- The prognosis after surgical evacuation of subdural SH was worse than after epidural SH.

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ABSTRACT

Background: Bleeding into the vertebral canal causing a spinal haematoma (SH) is a rare but serious complication to central neuraxial blocks (CNB). Of all serious complications to CNBs, neurological injury associated with SH has the worst prognosis. Around the turn of the millennium, the first guidelines aiming to reduce the risk of this complication were published. These guidelines are based on known risk factors for SH, rather than evidence from randomized, controlled trials (RCTs). RCTs, and hence meta-analysis of RCTs, are not appropriate for identifying rare events. Analysing data from a significant number of published case reports of rare complications may reveal risk factors and patterns undetectable in reports on occasional cases, and can thereby help to improve management of CNBs. The aims of the present review were to analyse case reports of SH after CNBs published between 1994 and 2015 with regard to diagnosis, treatment, and outcome of SH after CNB.
Methods: MEDLINE and EMBASE were utilized to find case reports published in English, German, or Scandinavian languages between 1994 and end of 2015, using appropriate search terms. Reference lists were also scrutinized for case reports. We documented initial and worst symptoms and signs of SH, diagnostic methods, treatment, and outcome of the SH. We calculated occurrences in per cent using the number of informative reports as denominator.
Results: One hundred and sixty-six case reports on spinal hematomas after CNB published during the years between 1994 and 2015 were identified. Eighty per cent of the patients had severe neurological symptoms (paresis or paralysis). When compared over time, outcomes have improved significantly. Among patients subjected to surgical evacuation of the hematoma, outcomes were best if surgery was performed within 12 hours from the first sign of motor dysfunction. However, even patients operated after more than 24 hours had relatively favourable outcomes. Whereas the outcomes after surgical evacuation of the epidural haematomas were quite satisfactory, only one of the operations for subdural haematoma (SSDH) resulted in a favourable outcome.

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Conclusions and implications: Suspicion of a spinal hematoma calls for the consultation of an orthopaedic or neurological surgeon without delay. MRI is the recommended diagnostic tool. Surgical evacuation within 12 h from the first sign of motor dysfunction seems to lead to the best outcome, although many patients operated as late as after more than 24 hours did regain full motor function. Despite the poor prognosis after surgical evacuation of SSDH, the outcomes after post-CNB spinal haematoma in general have improved significantly over time.

Contents

1. Introduction

Spinal haematoma (SH) is a rare but serious complication to central neuraxial block (CNB). Of all serious complications to epidural (EDA), spinal (SPA), or combined spinal/epidural (CSE) anaesthesia, neurological injury associated with SH has the highest risk of permanent disability. Around the turn of the millennium, the first guidelines aiming to reduce the risk of this complication were published [1,2]. These guidelines are based on known risk factors for SH, antihaemostatic drugs in particular, rather than evidence from randomized, controlled trials (RCTs) since these, and hence meta-analysis of RCTs, are not appropriate for identifying rare events [3]. Analysing data from a significant number of published case reports of rare complications may reveal risk factors and patterns not detectable in occasional reports [3], and can thereby help to improve management of CNBs. Current guidelines are often based on case report reviews published over 20 years ago [4–6]. The aim of the present review was to collect data from case reports on SH after CNBs published between 1994 and 2015 with respect to diagnosis, treatment, and outcome of patients suffering an SH after CNB for analysis and comparison with data from previous reviews [4–6]. Comparisons were also made between the first half (1994-2004) and the second half of the study period.

2. Methods

For collection of data etc. see Part 1 [7].

2.1. Severity of spinal haematoma

The severity of the initial and most serious symptoms and signs from the spinal haematoma was indicated by a four-graded scale according to Domenicucci et al [8]:

grade I: symptoms and signs were only somato-sensory (back pain, localized or radiating, paraesthesia, decreased sensibility) and/or sphincter deficits,

grade II: paresis,

grade III: paralysis (complete motor deficits).

Grade 0 indicates that none of the above symptoms or signs was present.

2.2. Grading of outcome of patients with SH after CNB

The outcome in patients with motor deficits was graded in four classes:

- *complete recovery* indicates that the motor function returned to the same level as before the CNB,
- *good recovery* indicates the motor function did not quite return to the pre-CNB level, but the patient was only marginally disabled and could resume normal, daily activities,
- *partial recovery* indicates that the patient was moderately disabled (e.g. could walk with crutches or walker),

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