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SHORT REPORT

Diagnostic criteria and the use of ICD-10 codes to define and classify minor head injury

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Background: Epidemiological research on the incidence of traumatic head injuries relies on the correct definition and classification of the injury.

Objective: To address the use of diagnostic criteria and ICD-10 codes to define minor head injury in Swedish hospitals managing patients with head injury.

Methods: A questionnaire was mailed to all 76 Swedish hospitals managing head injuries. The hospitals were asked what diagnostic criteria they use to define minor head injury, and which ICD-10 codes they use to classify such injuries.

Results: 72 hospitals (95%) responded to the survey. The most common criterion was loss of consciousness (76%), followed by post-traumatic amnesia (38%). Almost half the hospitals used other signs and symptoms to define minor head injury. The ICD-10 code S.06 (intracranial injury) was used by 51 of the hospitals (91%).

Conclusions: It is essential that there should be common definitions, classifications, and registration of minor head injuries. The wide variation in definition and classification found in this study emphasises the importance of improved implementation of the present guidelines.

Epidemiological research into the incidence of traumatic head injuries relies on the correct classification of the injury. For moderate to severe head injuries (Glasgow coma scale (GCS)¹ score 3–12), the classification does not usually pose any problems, as patients remain in hospital for several days or weeks. For minor head injuries (GCS 13–15) the classification is less obvious.² One reason may be the short stay in hospital for such patients. Another reason may be variations in the definition of minor head injury in cases where patients may be fully awake with no neurological deficits on admission to hospital. In a more recent classification, “mild head injury” is defined as GCS 14–15 and/or loss of consciousness without focal neurological deficits, while “minimal head injury” is defined as GCS 15 without loss of consciousness.^{3,4} Further studies are needed to determine the proper use of diagnostic criteria and classifications of head injuries, and to establish current practice within the health care system.

We undertook the present study to examine the use of diagnostic criteria and ICD-10 codes to define minor head injury in Swedish hospitals managing head injured patients.

METHODS

In a previous survey of the management of patients with minor head injuries in hospitals in Sweden, a questionnaire was mailed to all 76 hospitals managing such injuries.⁵ Seventy two hospitals (95%) responded to the survey. Of these, six are university hospitals with neurosurgical departments, 26 are central hospitals, and 40 are district general hospitals. The questionnaire was developed by our group and

Table 1 Diagnostic criteria*

Criterion	n	%
Loss of consciousness	58	82
Post-traumatic amnesia	30	42
Impaired level of consciousness	5	7
Absence of focal neurological deficit	6	8
Other signs and symptoms†	29	41
No definition	8	11

*In all, 64 hospitals listed which diagnostic criteria they used to define minor head injury.

†Vertigo, nausea, vomiting, headache, confusion.

Table 2 ICD-10 definitions and codes used to classify minor head injuries in Swedish hospitals

Definition	ICD-10 code	n	%
Superficial wound	S.00	6	6.4
Head wound	S.01	7	7.4
Skull fracture	S.02	5	5.3
Intracranial injury	S.06	51	54.3
Compression injury	S.07	3	3.2
Other head injury	S.09	6	6.4
No response to questionnaire		16	17

has been used in a similar study of the management of minor head injury in Norway.⁶ In this questionnaire, the hospitals were asked what diagnostic criteria they use to define minor head injury; and which ICD-10 codes they use to classify minor head injuries.

RESULTS

Diagnostic criteria

In all, 64 hospitals listed the diagnostic criteria they use to define minor head injury. Eight hospitals (11%) did not respond to this question. The diagnostic criteria and the frequency with which they were used are presented in table 1. The most common criterion was loss of consciousness (76%), followed by post-traumatic amnesia (38%). The absence of focal neurological deficits and the reaction level scale (RLS)⁷ score or the GCS score were listed by less than 10% of the hospitals. Twenty nine hospitals (45%) also used other signs and symptoms—such as vertigo, nausea, vomiting, headache, and confusion—to define minor head injury.

ICD-10 codes

In table 2 we list the different ICD-10 codes, together with the definitions, that are used to classify minor head injury. The

Abbreviations: GCS, Glasgow coma scale; RLS, reaction level scale

ICD-10 code S.06 was used by 51 of the hospitals (91%). Forty five of the hospitals (80%) used this code exclusively. Six hospitals (11%) used S.06 combined with other ICD-10 codes. Five hospitals (9%) did not use the code S.06; one used only S.00 and S.01; one used only S.02; and three used only S.09. Sixteen hospitals (22%) did not respond to the question.

DISCUSSION

Our results show an inconsistency in the definition of minor head injury but a fairly consistent use of ICD-10 code to classify such injuries.

“Minimal head injury” is defined as GCS 15 without loss of consciousness. “Mild head injury” is defined as GCS 14–15 and/or loss of consciousness for less than five minutes without neurological deficit. “Minor head injury” is defined as a GCS score of 15, with no loss of consciousness. Post-traumatic amnesia may be present, together with various other signs and symptoms.^{3,4} Patients presenting with a GCS score of 13 are classified as having moderate head injury.^{3,4} In the definition and classification of sports related cerebral concussion, it is stressed that any form of disturbance of mental status is to be considered a head injury.⁸

In the present study, the most common criterion was loss of consciousness, followed by post-traumatic amnesia, both of which may be absent following a minor head injury. Almost half the hospitals used other signs and symptoms to define minor head injury.

The correct use of ICD-10 codes to classify head injuries is imperative to enable stringent epidemiological studies to be done. Among the 72 Swedish hospitals that responded to the questionnaire, a large majority (91%) used the code S.06. Non-specific codes related to injuries to the skull, neck, and face were used by only five hospitals (9%). The use of S.06 is more common than previously reported. A recent study has compared data from an accident and emergency department case register on all head injury admissions with the list collected from the health authority's central database using the ICD-10 codes.⁹ Using the ICD-10 codes, less than 50% of all head injured admissions could be detected. A previous study also found that nearly two thirds of head injuries selected by the ICD codes were excluded when the medical records were reviewed.¹⁰

In the Scandinavian countries most patients with head injuries are treated in the smaller hospitals, usually by general surgeons. The distance to the regional neurosurgical department may be long.^{5,6} Thus it is essential that there should be common definitions, classifications, and registration of minor head injuries. Recently published guidelines address this problem. However, the value of such guidelines lies in their widespread use, not only in neurotrauma centres but also in smaller general hospitals.⁴ The present study emphasises the importance of improved implementation of the present guidelines.

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