
Practical application of the American guidelines: the Italian experience.

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Introduction

As already stated (1) the need for guidelines arose in USA following a survey which showed that the quality of treatment in most American trauma centres was far from optimal. A European survey (data collection in 1995) (2) showed similar findings: the need for guidelines is world-wide. The American guidelines (3) required a two year effort by a group of 10 American neurosurgeons. Even if the method was based on the "Attributes to guide the development of practice parameters" developed by the American Medical Association, most neurosurgeons were not familiar with words like «standard», «guidelines» and «options» or with «evidentiary tables». Therefore we must recognise to our American colleagues a sort of priority over the number of guidelines which followed the publication of the American guidelines. (4,5,6,7).

These guidelines were presented for the first time outside USA in Bologna in January 1995 to more than 200 neurosurgeons, intensivists and emergency physicians by Randall M. Chesnut. In Italy already since 1994 and independently from USA, a group of neurosurgeons and emergency physicians was working together to produce guidelines for minor head injury management (8). At the time of the American presentation the work was almost finished and therefore the movement toward severe injury was a logical consequence.

Process

A group of 20 neurosurgeons and 20 neurointensivists was formed ("the experts"). The Brain Trauma Foundation gave permission to translate the American guidelines as a basis for literature review, discussion and education. The guidelines were divided into 2 parts: prehospital – admission care and medical therapy. Surgical therapy, which was not contained in the American guidelines, was added. The step by step process started in 1995 and was completed in 1998. Meetings of the experts were followed by proposals which were discussed in general meetings and so on. The process involved 400-500 people all over the country. Three papers have already been published (9) or are in publication both in Italian and English.

The differences

Most of the Italian guidelines are a detailed and educational explanation of the American guidelines. There are, however, both additions and changes:

Referral policy

In Italy as in most parts of Europe, there are no trauma centres. There is, however, a form of trauma system: neurosurgical units are located in a few regional hospitals/universities. The quality of care is often determined by the relation-

ships between central and peripheral hospitals. In most of the country there is no possibility of admitting all severely head injured patients to hospitals with neurosurgical Units. All the guidelines for head injury management should therefore contain, to be applicable, suggestions for the referral policy of peripheral hospitals. So we added to the part of the American guidelines on the prehospital care practical suggestions about where to transport the patient.

First scenario: Clinical deterioration on the scene of accident (GCSm dropped by 2 points, appearance of pupillary abnormalities) in a patient haemodynamically stable: immediate transfer to Neurosurgical Centre by helicopter and/or medical ambulances

Second scenario: Patient in coma who, in spite of primary resuscitation on the scene of accident, has not yet stabilised (f.i. arterial hypotension suggestive of serious chest/abdominal bleeding):

The patient must be taken to the nearest Hospital with 24 hour General Surgery, Intensive Care Unit and Radiology including ecography and CT scan. Once achieved resuscitation of blood pressure and established adequate ventilation and oxygenation, a CT scan must be obtained and Neurosurgery will be contacted (better video-link than phone).

In the last 2 years there has been a tremendous increase of video-links between Neurosurgical Units and referral hospitals in Northern Italy: one hospital has 5 links, two hospitals 3 links, five hospitals 2 links, twelve hospitals 1 link

Third scenario: Extra Hospital environment: patient in coma with possibly isolated brain injury and with stable BP and adequate ventilation. Whenever possible we suggest going straight to Hospitals with Neurosurgery / NeuroICU from the scene of accident. In the case of non possible direct admission to Neurosurgery, the patient must be taken to

the nearest regional hospital with: intensivists 24 hrs/day with an ICU Unit, CT scanner, general radiology, general surgery.

In the case of non possible direct admission to Neurosurgery we recommend: computer video-link with peripheral hospital, protocol for repetition of CT scanning integrated into the guidelines, neurosurgical consultation.

CT scan monitoring.

Once obtained a brain CT with bone windows:

1. *absence of posttraumatic lesions*: a CT scan will be repeated within 24 hrs. In the case of arterial hypotension (10) and / or abnormal coagulation on admission (11) and if a skull fracture is seen on bone windows (12), a CT scan must be repeated within 12 hrs.
2. *presence of posttraumatic lesions*: a CT is repeated within 12 hrs. if the first CT was obtained within 3/6 hrs from injury (13) and in case of risk factors (see above). If the first CT was obtained six or more hrs after trauma, the second CT can be repeated within 24 hrs.
3. *An emergency CT scan* is obtained in the case of clinical deterioration (GCSm dropped by 2 scores, appearance of pupillary abnormalities), ICP increase over 25mm Hg for more than 15 min, CPP decrease < 70 mm Hg for more than 15 min.
4. *Follow up CT scan*: in patients admitted to an intensive care Unit follow up examinations are advised on day 3, 5 and 7 after injury. (14). We have also introduced the use of the Marshall classification for CT scan, slightly modified according to EBIC (4).

No more differences are found in the first two parts on pre-hospital and admission care /medical therapy.

We have added a chapter on surgical indication containing both general criteria for surgery (midline shift >5 mm, single lesion volume > 25 (15)

and specific criteria for acute epidural haematomas, subdural haematomas and brain contusions/intracerebral haematomas. (16).

An algorithm was devised containing clinical, CT and monitoring derived (ICP / CPP) criteria for surgery in comatose patients. Whenever the neurological status is improving (we stress the importance of therapeutic windows during the first two days), the ICP is less than 20 mm Hg and the general CT criteria are fulfilled, a conservative management can be adopted.

The decision about surgery should be taken, however, after the failure of the «first tier» therapy (conventional therapies,) (3) before the use of the second «tier» therapy with a risk of ischemic damage.

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