

## CHILDREN'S BRAIN CONTUSION - GRADU LEVI

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*A total of 676 children with a diagnosis of brain contusion - gradu levi (BC-gl) were examined. A comparison was made with brain concussion leading to the conclusion that the symptoms of BC-gl were more severe and variable. Two types of fluctuation of altered consciousness and biphasic awakening were described. The damaged consciousness, headache, vomiting, amnesia, and traumatic cerebral nerve injury were the "cardinal symptoms" of BC-gl. Epileptiform changes were rare (in 6 % of the cases) but alarming findings. The great variety of symptoms facilitated BC-gl diagnosis. The prognosis was favourable.*

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**Key-words:** Brain contusion -gradu levi, diagnosis, development stages, children

### INTRODUCTION

Brain contusion - gradu levi (BC-gl) is a traumatic clinical syndrome which is very close to brain concussion. We include in it cases of insignificant or moderate generalized and focal symptoms lasting up to several days with loss of consciousness for 1-2 hours only but without any brain stem symptoms. In this aspect, we agree with the opinion expressed by some other authors (2, 4, 6, etc.).

Our aim was to trace out the framework and the clinical boundaries of BC-gl in children based on our own clinical material and experience and thus to provide a short and easy to understand clinico-

diagnostical characterization of this syndrome.

### MATERIAL AND METHODS

The examined contingent included 676 children diagnosed as having BC-gl. An attempt was made to present an average collective clinical image of BC-gl by reducing them to a common "clinical denominator" and analysing their symptoms.

The assessment of the symptoms permitted the definition of three types of clinical manifestations:

1. Disturbances in the state of awareness, memory, as well as other psychic manifestations.
2. Vegetative symptoms.
3. Neurological symptoms.

The unified scheme of symptom ascertaining helped the determination of the

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most important and common signs which formed the clinical picture of BC-gl.

## RESULTS

Based on the analysis of the whole group of 676 cases it could be concluded that symptoms of BC-gl were richer, severer, and more variable in comparison with these in brain concussion. More than 2/3 of the patients showed obnubilation immediately after trauma.

Initial loss of consciousness (ILC) after trauma was registered in 460 cases (in 68 per cent of the children). Its duration was of approximately 15-30 min but rarely up to 2 hours. Second came the obnubilation. The awakening was usually delayed. It took more than half an hour in 43 per cent of the patients. The longer the ILC, the longer the obnubilation. In almost one half of the children we observed certain phases and fluctuation of the changed consciousness. The awakening was commonly biphasic. We distinguished between two types of biphasic awakening:

type one: ILC - excitement - deafness - awakening

type two: (ILC  $\pm$ ) - somnolency - deafness - awakening.

Changes in consciousness were considered the principal clinical characteristics of BC-gl. They occupied a leading position in the "symptomatic hierarchy".

Headache was observed in 460 cases. Its high frequency (of 68 per cent) made it the second important and informative symptom. This was a subjective expression of the ailment that was stronger and lasted longer than headache in brain concussion. The duration was of approximately 3-5

days in older children. Severity of headache depended on that of injury and accompanying phenomena. Headache was a "cornerstone" in the diagnosis of BC-gl and the efficacy of its treatment.

Vomiting came third according to frequency rate (in 61.8 per cent of the cases) remaining the most important sign in the series of vegetative manifestations. It was a dominant "cardinal symptom". Vomiting was preceded by nausea, a particularly unpleasant vegetative symptom for small children, in 34.02 per cent of the patients. It was usually of recurrent nature. That was why vomiting was considered a component of the classical "triad of symptoms" of head injury.

Muscular hypotony appeared in 52 per cent of the cases as an initial symptom along with the phase of disturbed consciousness and general hyporeflexia. Amnesia was a common and meaningful manifestation of BC-gl (in 36.5 per cent of the cases). Antograde amnesia was found out in 165 children (24.4 per cent), retrograde amnesia in 9.02 per cent but congrade amnesia - in 3.25 per cent of the patients. Amnesia was most common and of longest duration in cases with traumatic coma thus presenting one of the criteria for the severity of head injury and of BC-gl, in particular.

Traumatic cerebral nerve injury manifested mainly as basal trauma with skull fracture and arachnoid haemorrhage was registered in 240 patients (in 35.5 per cent of the cases). The oculomotor, olfactory, auditory, and facial nerves were usually most severely affected. Skin paleness was established in 190 of the patients (28.10 per cent) commonly accompanied by arterial hypertension

tachycardia. It could be misleadingly interpreted as a state of shock. Psychomotor excitement and anxiety was observed in 155 children (in 22,9 per cent of the cases) in the phase of awakening. This corresponded with the meningeal symptom in subarachnoid haemorrhage and skull fracture. Dizziness occurred as a transient symptom of short duration in older children after awakening in 20.7 per cent of the cases. Hyporeflexia was registered in the initial stage of BC-gl in 20.26 per cent of the patients. Otorrhagia as a manifestation of skull base fracture was observed in 115 children (in 17.01 per cent of the cases). It was commonly short-lasting, meagre and discontinued spontaneously. Meningeal symptoms were registered in 110 children (16.27 per cent) with BC-gl but not in cases with brain concussion. They were typical of BC and developed on the second and/or third day after trauma. This finding was usually indicative of resorptive meningeal symptoms and could be accompanied by subfebrility. Pyramidal lesion signs and transient hemiparetic manifestations were established in 58 of the children (in 8.5 per

cent of the cases). Epileptiform changes were rare findings - in 41 children (6.0 per cent) only. They were commonly focal and not relapsing. However, they were meaningful and alarming. They required systemic EEG follow-up along with long-lasting preventive anticonvulsive therapy.

## DISCUSSION

Our data were of diagnostic and prognostic importance. The subcutaneous and subperiosteal haematomas were the most typical local alterations indicating the enormous severity of the injury. Due to the great variety of symptoms, BC-gl were easy to observe. The prognosis was favourable. All the patients needed at least 15 days of hospital treatment.

Numerous authors (1, 5, 9, etc.) did not differentiate the single phases of brain contusions. We failed to find similar investigations reported in our national literature available (7, 8). That was why, in our opinion, this paper could contribute to the better understanding of the clinical image of BC-gl in childhood.

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## Die Hirnkontusion leichten Grades im Kindesalter

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**Zusammenfassung:** Es wurden 676 Kinder mit der Diagnose einer Hirnkontusion leichten Grades (Hk-IG) untersucht. Im Vergleich zu der Hirnerschütterung war die Symptomatik der Hirnkontusion schwerer und mannigfaltiger. Es wurden zwei Typen der Varierung der Bewußtseinsstörungen und eine biphasische Erwachung beschrieben. Die Bewußtseinsstörungen, die Kopfschmerzen, das Erbrechen, die Amnesie und die Verletzungen der Hirnnerven waren die "wichtigsten Symptome" der Hk-IG. Die Krampfanfälle waren ein seltener (in 6 % der Fälle), aber alarmierender Befund. Die Vielfalt von Symptomen erleichterten die Diagnose der Hk-IG. Die Prognose war günstig.

## Contusion cérébrale chez les enfants - degré léger

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**Résumé:** On a étudié 676 cas d'enfants avec une contusion cérébrale degré léger (CC-dl). La symptomatique de la CC-dl comparée a celle de la secousse cérébrale s'aggrave et augmente. On décrit deux types de la connaissance biphasique et de la fluctuation du trouble de la conscience. Le trouble de la conscience, le mal de tête, le vomissement, l'amnésie et les troubles des nerfs crâniens sont "les grands symptômes" de CC-dl. Les symptômes épileptiques sont rares (6 %), mais alarmants. Le spectre symptomatique de la CC-dl est plus large, ce qui facilite la visibilité diagnostique. Le pronostic est favorable.