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Presence of Klùver-Bucy syndrome as a positive prognostic feature for the remission of traumatic prolonged disturbances of consciousness

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After severe brain injury a prolonged disturbance of consciousness may occur, sometimes with transient apallic syndrome (awakening without awareness of self and surroundings). Klùver-Bucy is described in the literature as a typical post-traumatic remission phase, in which the patients show an increase of oral automatisms and/or of sexual drive. The study describes Klùver-Bucy syndrome as a sign associated with favourable prognosis in the outcome of traumatic disturbances of consciousness in survivors of head trauma. Seventy-seven patients who had suffered severe brain injury due to traffic accidents entered into the study. All had experienced a relatively benign clinical course since they recovered full awareness, that is were able to communicate with their relatives. The occurrence of prolonged coma, of apallic syndrome and of Klùver-Bucy syndrome are related to outcome date in regards to the patient's work and family function at a mean of 32 months later. In particular, the duration of the apallic syndrome (duration of unconsciousness) was significantly correlated with the global outcome of the patients ($p < 0.001$).

Key words: brain injury; traumatic apallic syndrome; Klùver-Bucy syndrome; social integration

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Prolonged disturbances of consciousness such as prolonged coma or apallic syndrome have been described in patients who survive severe traumatic and non traumatic brain damage (1–5). Prolonged coma is defined as a persistence in time of coma for several weeks, with complete or partial recovery of the awareness after the eyes opening (awakening). Apallic syndrome may occur in patients who recover from deep coma and is defined as awakening without awareness of self and surroundings. The patients appear at least awake but are not able to establish any contact with the environment. The patients remain inattentive, never speak and show no signs of awareness of the environmental or inner need; responsiveness is limited to primitive postural and reflex movements of the limbs. In brief, there is arousal or wakefulness, without awareness or responsiveness (1). Optic fixation and emotional participation to the environment are considered the first convincing signs of awareness. A complete description of post-traumatic apallic syndrome and of the possible remission stages until recovery has been previously reported (2). Klùver-Bucy syndrome has first been described as a result of total bilateral temporal lobectomy in rhesus monkeys (6). In particular, Klùver-Bucy syndrome has already been reported in literature as a typical post-traumatic remission phase (7). This syndrome, consisting in the increase of oral automatisms and of sexual drive, has been interpreted as a disconnection syndrome with loss of inhibitory cortical control over the limbic system (8).

To identify some clinical predicting markers in the outcome of prolonged disturbances of consciousness, we performed a retrospective study, comparing patients who suffered from traumatic prolonged coma with patients who suffered from traumatic apallic syndrome with relatively benign clinical course. The occurrence and the possible prognostic meaning of Klùver-Bucy syndrome was also studied.

Material and methods

Seventy-seven patients (59 M, 18 F), with a mean age of 25.8 years (range 14–61 yrs) who had suffered from severe brain injury, secondary to traffic accidents, entered the study. Thirtynine patients suffered from prolonged coma and 38 from traumatic apallic syndrome. Prolonged coma was defined as the persistence of coma for at least 10 days. The diagnosis of coma was performed according to the classical Jennet' definition of no eye-opening, no words uttered, and not obeying commands (9). Apallic syndrome was defined as the presence of awakening (open eyes) without awareness of self and surroundings (lack of any contact with the environment). All patients had a benign clinical course, in that they recovered awareness and full contact with the environment at different times. The interval between the brain injury and our evaluation was a mean of 32.2 months (range: 12–54 months) and only patients who were in a stable remission (no significant changes of the global disability) for at least 3 months were included. All patients performed CT scan at least two months after brain injury, at the admission to our Rehabilitation Center, that is late enough to show stable injuries.

A disability interview based on the Glasgow outcome scale and consisting of the daily living abilities of the patients (including self care and gait authonomy), was conducted with the patients and their relatives. Gait disturbances were defined as the need of help during gait. Accordingly the whole patient population was divided in 3 groups: A) patients with full integration in work activities; B) patients who were independent in daily living; C) patients who were dependent on others for daily living.

Statistical analysis of the data was performed by means of the Chi-square and Mann Whitney "U" tests.

Results

No significant differences in the clinical outcome was found between patients examined after one year from the brain injury and those later examined. No statistically significant correlation was found between age of the patients and outcome, likely due to the number of the subjects.

We studied 77 patients (59 M, 18 F) with a mean age of 25.8 years (range 14–61 yrs) who had suffered from severe brain injury and secondary prolonged disturbance of consciousness. Duration of coma (with closed eyes), as defined above (9), varied from 10 to 25 days, without any statistically significant differences in the distribution between the 2 groups. Thirty-nine patients showed prolonged coma and 37 developed traumatic apallic syndrome. No statistically significant differences were found between the 2 groups with regard to sex and age. Post-traumatic amnesia and length of stay in hospital were significantly longer in the apallic group, as a consequence of the longer period of unconsciousness, in comparison with the group with prolonged coma. Seventeen patients (22%) were integrated in work activities; 36 (46.7%) were independent in daily living, but were not able to return to work; and 24 (31.1%) were dependent on others for daily living (Table 1).

The comparison between patients with prolonged coma and patients who developed a transient apallic syndrome showed a significant better global outcome for the former group, in particular in the reintegration in work activities ($p < 0.01$).

The duration of coma (unawareness with closed eyes) in the acute phase showed a trend to a significant inverse correlation with the clinical outcome ($p = 0.076$) and a statistically significant inverse correlation with the incidence of post-traumatic gait disturbances ($p < 0.05$). Moreover, the duration of the apallic syndrome (length of time of awareness with open eyes without awareness) was significantly correlated with the global outcome of the patients ($p < 0.001$) (Tab. 2).

The development of a Klùver-Bucy remission phase after a prolonged disturbance of consciousness occurred within the first two months (6–60 days from the brain injury), with higher incidence in the first 30 days. The criteria for diagnosing patients as having a Klùver-Bucy syndrome should include at least a frequent manipulation of the genitals and a tendency to explore objects by mouth. The time course of the Klùver-Bucy syndrome was extremely variable and could last from 7 days up to 3 months. Duration of coma (unawareness with closed eyes) showed a statistically significant correlation with the occurrence of Klùver-Bucy syndrome, in that, as longer the coma lasted, the occurrence of Klùver-Bucy became less frequent ($p < 0.05$). Klùver-Bucy syndrome was significantly correlated with a good clinical outcome ($p = 0.05$). In particular, the occur-

Table 1. Global outcome of the patients suffering from traumatic apallic syndrome in comparison with patients suffering from prolonged coma

	GROUP A Work integr.	GROUP B Family integr.	GROUP C Not independ.	Total
Apall. syndr.	5 13.2%	16 42.1%	17 44.7%	38 52.1%
Prolong. coma	12 34.3%	18 51.4%	5 14.3%	35 47.9%
Total	17 23.3%	34 46.6%	22 30.1%	73 100.0%

Number of missing observations=4, Chi-square=9.43, sign.=0.008.

Table 2. Duration of apallic syndrome with regard to clinical outcome

	No.	Mean (days)	Range (days)
Patients integrated in work activities	5	40±15.8	30–60
Patients family integrated	16	137.1±50.4	35–240
Patients dependent on others	17	298.8±130.3	150–600
Student's "t" test: $p<0.001$		T=6.4188	Prob.=6.703

Table 4. Occurrence of Klùver-Bucy syndrome in patients with apallic syndrome and prolonged coma

	Klùver-Bucy	
	yes	no
Apallic syndrome	9	17
Prolonged coma	11	19
Number of missing observations:	21	
Chi-square	0.46 n.s.	

rence of the Klùver-Bucy syndrome, as a post-traumatic remission phase, showed a trend to a significant positive correlation with the integration in work activities ($p = 0.05$) (Tab. 3). The occurrence of Klùver-Bucy syndrome was not significantly different in the two patient groups (Tab. 4). There was no significant correlation between the presence of the Klùver-Bucy syndrome as post-traumatic remission stage and the localization of CT lesions in the temporal lobe (Tab. 5).

Discussion

As other authors have already reported (9, 10), our results suggest that the longer the apallic syndrome lasts, the fewer are the possibilities of social reintegration.

In our study, the presence of Klùver-Bucy syndrome as a transient remission phase from traumatic apallic syndrome seems to be a positive prognostic feature for the global outcome or, more specifically, for the return to work of the patients. The positive prognostic meaning of a transient Klùver-Bucy syndrome may be explained as a recovery of the functions of the limbic system, not yet under the control of the cortical functions, only for the patients suffering from prolonged disturbances of consciousness with benign clinical course, who later recovered consciousness (8). The recovery could resemble a reintegration process in the opposite direction of the rostral-caudal deterioration of Plum & Posner, who described different severity stages of coma as a progressive impairment of brainstem, from dyencephalon to bulbar structures (11). The recovery process from prolonged unconsciousness could follow the inverse way, with a progressive refunctioning of the vital structures (brainstem) up to the limbic structures and finally to the cortex.

In conclusion, it should be emphasized that in some favourable cases, the traumatic apallic syndrome may be reversible, and that the duration of such a prolonged disturbance of consciousness plays the most important role in the possible recovery from the apallic syndrome. The presence of Klùver-Bucy syndrome, if confirmed in larger series, could be a positive prognostic feature for the remission of prolonged disturbances of consciousness.

To better identify significant prognostic markers, a comparison between patients suffering from reversible apallic syndrome with benign clinical course (regaining of consciousness) and those with persistence of the unconsciousness for longer than one year, could be of great interest. In our opinion, only these latter cases should be defined as persistent vegetative states or persistent apallic syndromes.

Table 3. Global outcome of the patients with Klùver Bucy as remission phase in comparison with patients without Klùver Bucy

		GROUP A Work integr.	GROUP B Family integr.	GROUP C Not independ	Total
Klùver Bucy	+	9 47.4%	6 31.6%	4 21.1%	19 35.2%
	−	6 17.1%	19 54.3%	10 28.6%	35 64.8%
Total		15 27.8%	25 46.3%	14 25.9	54 100.0%

Number of missing observations=23, Chi-square=5.69, sign.=0.05, + patients with Klùver Bucy, − patients without Klùver Bucy.

Table 5. CT lesion localization in patients with and without post-traumatic Klùver-Bucy syndrome

	Klùver-Bucy	
	+	−
Frontal	5 31.3%	11 68.8%
Temporal	2 25.0%	6 75.0%
Frontal+temporal	4 44.4%	5 55.6%
Others	8 38.1%	13 61.9%
Chi square 0.888	not significant	

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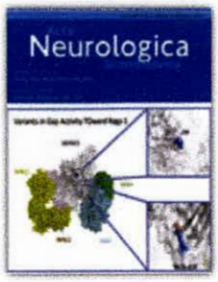

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