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Postoperative Mortality in Supratentorial Gliomas

Śmiertelność pooperacyjna w glejakach nadnamiotowych mózgu

Послеоперационная летальность в супратенторяльных глиомах мозга

In the early days of neurooncology (the end of the XIXth century), the mortality rate in supratentorial gliomas ranged from 50 to 100%, depending on the preoperative condition of patients (2). Introduction of new trends in the treatment of gliomas by Cushing resulted in a significant decrease of mortality rate in postoperative patients. This achievement was potentiated by modern neurooncology.

Very often in clinical reports, data concerning postoperative mortality in supratentorial gliomas are presented without the analysis of the dependence of the mortality rate on various clinical features.

MATERIAL AND METHODS

The material consisted of 71 patients operated in the Department of Neurosurgery in Lublin during 1973—1975 because of supratentorial gliomas of the brain. The statistical significance of dependence was evaluated by means of tests: χ^2 and *t*-Student. Results with the risk of error smaller than 5% were taken as statistically significant.

RESULTS

The term postoperative mortality refers to the percentage of patients whose death was connected with operation and postoperative complications. 16 patients died; the mortality rate was 22.5%. The average time of survival of these patients after operation was 12 days. The highest postoperative mortality occurred during the first week (Fig. 1).

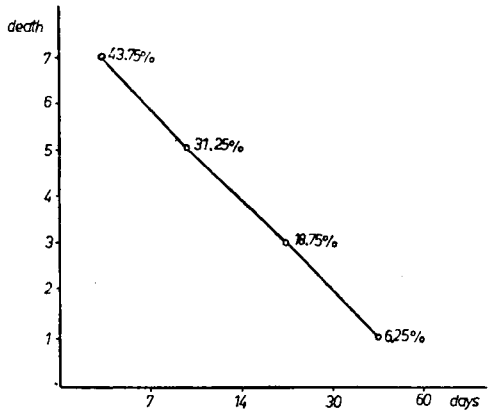

Fig. 1. Postoperative mortality

Table 1 presents the dependence of postoperative mortality on various clinical features. The preoperative clinical state of patients did not have any significant influence on the rate of postoperative mortality, although higher death rate was found in patients with a severe preoperative state. The statistically significant higher mortality occured in patients in who the macroscopic partial resection of gliomas was performed ($p<0.025$). No significant effect of the extent of operation on the postoperative mortality was found.

Table 1. Postoperative mortality and its dependence on some clinical features constants

Postoperative mortality	Total	Preoperative clinical state			Completeness of resection		Extent of resection		Localization		Histopathological sort		Average age years/	Average duration of symptoms /months/
		good	average	severe	total	partial	extensive	narrow	superficial	deep	glioblastoma	astrocytoma		
Number of deaths	16 /22.5%/	6	5	5	1	15	5	11	4	12	9	7	47.8	10.8
Significance		no significance			$p < 0.025$		$p < 0.1$		$p < 0.1$		$p < 0.7$		$p < 0.7$	$p < 0.05$
Number of patients	71	27	27	17	23	48	37	34	31	40	41	30	48.0	6.0

The location of gliomas was without significant influence on the rate of death of patients. Nevertheless, higher mortality was noted in patients with deeper location of tumors. The histopathological character of the tumor had no conection with the higher mortality. The average age of patients who died did not differ significantly from those who left the hospital. The duration of symptoms had a statistically significant effect

on the death rate. The period of illness was significantly longer in patients who died ($p<0.05$).

The cause of death in 12 cases were intracranial complicatinos while in 4 patients complications were not connected with the brain. 5 of these patients died despite the performance of reoperation. The causes of deaths were presented in Table 2. The most frequent case of postoperative death was oedema of the brain and haematoma in the postoperative lodge. The most frequent extracranial complication was pneumonia.

Table 2. Causes of postoperative mortality

Causes of death	Number of dead patients	
	n	%
brain oedema	5	31.25
hematoma loco op.	4	25.0
pneumonia	4	25.0
abscess and encephalitis	1	6.25
encephalomalatio	1	6.25
bleeding to ventricles	1	6.25
Total	16	100.0

DISCUSSION

According to Cushing (3) any death of a hospitalized and operated patient, independent of the cause of death, was termed a postoperative death. This criterion was employed in evaluation of material presented in this paper and in papers of other authors (12, 13). Some authors limit the period of the postoperative mortality to one mouth (1, 4, 9, 14), others to one week (6) or even to early tree days (8). Because of the variety of criterions, the precise comparison of the postoperative mortality, according to many authors ranges from 15 to 45% (1, 4, 6—8, 10—14).

The dependence of the postoperative mortality on some clinical factors was mentioned in the literature. Mazurowski et al. (11) and other authors (14) claim that a severe clinical state of patients, particulary intracranial herniation, increased the rate of postoperative mortality. The complete removal of tumor without damage of the deep structures was, according to Szapiro t al. (14), without any effect on the postoperative mortality. Some authors claim that a complete removal decreases the postoperative mortality (6, 8), while the partial resection increases it (7, 12). The statistical significance of the influence of a complete removal of the tumor on the postoperative mortality was confirmed by this study. According to Hitchcock et al. (8) the postoperative

mortality in patients with a partial resection of gliomas was 4%, with internal decompression 10%, with biopsy 27%. The localization of gliomas affects the postoperative mortality (5, 8, 14). It amounts to 27% in unilobar tumors, in bilobar — 44%, while in reciprocal — 50% (5). The histopathological sort of a tumor has no influence on the rate of postoperative mortality (12, 14). This was confirmed by our material. According to some authors the postoperative rate in aged patients was higher than in young ones (8, 14).

Conclusions

1. The postoperative mortality in supratentorial gliomas was 22.5%.
2. A statisticaly significant dependence of postoperative mortality on the completeness of excision of the tumor and duration of illness was found.
3. The dependence of postoperative mortality upon preoperative clinical state, age of patients, and histological sort of tumors was not confirmed.

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STRESZCZENIE

Dokonano analizy śmiertelności pooperacyjnej chorych, leczonych z powodu glejaków nadnamiotowych w Klinice Neurochirurgii AM w Lublinie, i jej zależności od niektórych cech klinicznych. Śmiertelność pooperacyjna wynosiła **22,5%**. Stwierdzono statystycznie istotnie wyższą śmiertelność pooperacyjną w grupie chorych z częściowym zabiegiem operacyjnym. Czas trwania dolegliwości pacjentów, którzy zmarli, był istotnie dłuższy od okresu dolegliwości pozostałych przy życiu chorych. Nie stwierdzono statystycznej zależności śmiertelności od przedoperacyjnego stanu klinicznego, rozległości zabiegu, lokalizacji i rodzaju histopatologicznego glejaków oraz wieku chorych.

РЕЗЮМЕ

Исследовано больных Неврохирургической клиники Медицинской академии в Люблине леченных от глиом супратенторяльного мозга. Проведено анализ послеоперационной летальности больных и ее зависимость от некоторых клинических признаков. Послеоперационная летальность выносила 22,5%. Статистически установлено существенно высокую послеоперационную летальность у больных с частичным операционным вмешательством. На основе распроса больных определено, что период недуга больных, которые позже умерли, был значительно длиннее, чем период остальных больных. Не определено статистической зависимости летальности от дооперационного клинического состояния, протяжности вмешательства, локализации и гистопатологического вида глиом, а также возраста больных.