Canadian Preoperative Prediction Rule for Hydrocephalus

The "Canadian Preoperative Prediction Rule for Hydrocephalus" in children with Pediatric posterior fossa tumors which is proposed by Jay Riva-Cambrin is a working system for predicting and decision making.

The system depends on seven different criteria which are assigned scores with a total possible value of 10 and predicts the probability of the need for postoperative hydrocephalus treatment.

A modification of this system was offered, and the "presence of papilledema" was replaced with the presence of "transependymal edema" which can be assessed with computerized tomography (CT) or magnetic resonance imaging.

Predictor	Score
Age <2 years	3
Presence of papilledema (later replaced with transependymal edema)	
Moderate/severe hydrocephalus	2
Cerebral metastases	3
Preop estimated tumor diagnosis	
Medulloblastoma	1
Ependymoma	1
Dorsally exophytic brainstem glioma	1
Total possible	10

CPPRH score	Probability of hydrocephalus at 6 months after resection
0	0.071
1	0.118
2	0.191
3	0.293
4	0.422
5	0.562
6	0.693
7	0.799
8	0.875
9	0.925
10	0.956

Riva-Cambrin et al. evaluated a derivation cohort of 343 consecutive children with posterior fossa tumors who underwent treatment between 1989 and 2003. Multivariate methods were used on these data to generate the Canadian Preoperative Prediction Rule for Hydrocephalus. The rule's estimated risk of postresection hydrocephalus was compared with risk observed in 111 independent patients in the validation cohort.

Variables identified as significant in predicting postresection hydrocephalus were age < 2 years (score of 3), papilledema (score of 1), moderate to severe hydrocephalus (score of 2), cerebral metastases (score of 3), and specific estimated tumor pathologies (score of 1). Patients with scores > or = 5 were deemed as high risk. Predicted probabilities for the high- and low-risk groups were 0.73 and 0.25, respectively, from the derivation cohort, and 0.59 and 0.14 after prevalence adjustment compared with the observed values of 0.42 and 0.17 in the validation cohort.

A patient's score on the Preoperative Prediction Rule for Hydrocephalus will allow improved patient counseling and surgical planning by identifying patients at high risk of developing postresection hydrocephalus. These patients might selectively be exposed to the risks of preresection CSF diversion to improve outcome ¹⁾.

The mCPPRH utilizes readily obtainable and reliable preoperative variables that together stratify children with posterior fossa tumors into high- and low-risk categories for the development of postresection hydrocephalus. This new predictive model will aid patient counseling and tailor the intensity of postoperative clinical and radiographic monitoring for hydrocephalus, as well as provide evidence-based guidance for the use of prophylactic CSF diversion ².

Low-risk patients can be monitored conservatively with or without an intraoperative external ventricular drainage, while high-risk patients require the use of an intraoperative extraventricular drain, higher postoperative hydrocephalus surveillance, and even consideration for a preoperative endoscopic third ventriculostomy ³⁾.

1)

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