Role of IVH Score in Estimating Intraventricular Hemorrhage

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Conflicts of Interest: Nil

Abstract

Background: Spontaneous intracerebral hemorrhage (ICH) accounts for one fifth of all strokes. It is a devastating condition with 30% mortality and a high rate of morbidity among survivors.

Methods: This study was carried out on 40 patients of either sex of various age group treated at SDM Hospital, Jaipur, who have undergone CT scan of head.

Results: Mild IVH score of 1-4 was noted in 20(50%) cases. moderate score of 5-8 was noted in 26 patients. 40% patients moderate score had present with ICH. Patients with better IVHS of 1-4 had a better outcome score at the end of 2 weeks assessment.

Conclusion: IVHS is a powerful determinant of outcome.

Keywords: Intracranial Hemorrhage, Intraventricular Hemorrhage, Outcome.

Introduction

Spontaneous intracerebral hemorrhage (ICH) accounts for one fifth of all strokes. It is a devastating condition with 30% mortality and a high rate of morbidity among survivors[1]. Intraventricular extension of intracerebral hemorrhage (IVH) that occurs in 45% of cases [2] is a known independent predictor of poor outcome and several studies have demonstrated a direct relation between IVH volume and poor outcome or mortalit[3]. Yet, most studies investigating IVH volume use sophisticated and time-consuming volumetric analyses that are impractical for routine clinical use and clinicians still lack a method for easily obtaining an estimate of the IVH volume[4].

Methods

This study was carried out on 40 patients of either sex of various age group treated at SDM Hospital, Jaipur, who have undergone CT scan of head.

Patients were included if they suffered from spontaneous nontraumatic ICH and had evidence of IVH on computed tomography (CT) during admission done within 24 hours of onset. Patients were excluded from the analysis if they had ICH secondary to vascular malformations, tumor, or hemorrhagic conversion of an infarct. All CT scans were done using identical technique (slice thickness 5 mm, gantry tilt −16). We also excluded patients who had CT of inadequate quality for measurement purposes.

Results

Table no.1.IVH score in relation to age range.

S.No	Age (yrs)	IVH(1-4)	5-8	9-12
1	0-10	4	1	0
2	11-20	1	0	0
3	21-30	1	1	0
4	31-40	2	2	0
5	41-50	2	2	1
6	51-60	4	1	0
7	61-70	1	5	3
8	71-80	2	2	0
9	81-90	3	2	0
	Total	20(50%)	16(42.5%)	4(7.5%)

Mild IVH score of 1-4 was noted in 20(50%) cases. moderate score of 5-8 was noted in 26 patients.

Table no.2 intracranial hemorrhage in relation to IVH score.

S.No.	IVHS	ICH(+)	ICH(-)
1	1-4	15(30%)	5(20%)
2	5-8	16(40%)	0
3	9-12	4(10%)	0

40% patient's moderate score had present with ICH.

Table no.3.IVHS relation to etiology

Etiology	IVHS (1-4)	5-8	9-12
Hypertension	4	8	4
Trauma	10	3	0
Aneurismal	1	1	0
Coagulopathy	1	0	0
Undetermined	4	4	0
Total	20(50%)	16(40%)	4(10%)

Moderate sore mostly in HT patients. Trauma related patients had better IVHS.

Table no.4.IVHS with glassgow outcome score at 2 weeks.

IVHS	I	II	III	IV	V
1-4	12	5	1	0	2
5-8	5	3	2	3	3
9-12	0	0	1	0	3
Total	17	8	4	3	8

Patients with better IVHS of 1-4 had a better outcome score at the end of 2 weeks assessment.

Discussion

IVH remains a poorly understood phenomenon. Previous work has demonstrated that IVH volume is an important factor contributing to outcome and survival. Two investigators studying IVH using a 12-point grading system found an association between high IVH grade and poor outcome [5]. The relationship of IVH volume and outcome has also been studied in a series of 47 patients [6], which identified a "lethal volume" of 20 mL, and there was an observed association between TV and poor outcome. Another study showed that IVH volume predicts mortality independently of the GCS[7]. Most recently, the dynamic nature of IVH was studied in a subanalysis of the activated factor VII phase II trial [8] demonstrating the importance of changes in IVH volume. However, the study of IVH volume and its clinical application has been hampered by the difficulty of measuring the volume of blood in routine clinical practice. Unlike ICH where the hematoma is relatively well defined and lends itself to volume approximation methods such as ABC/2 [9], IVH is more diffuse and involves multiple structures. The results from this study demonstrate that using a simple grading system, IVH volume can be closely estimated within minutes after acquisition of the head CT, requiring only visual inspection of the CT and a reference card. Our findings are in agreement with previous studies showing the important impact of IVH volume on clinical outcome[10].

Conclusion

VHS enables clinicians to rapidly estimate IVH volume. The addition of IVH to ICH volume increases its

predictive power for poor outcome and mortality significantly.

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