

**INTERESTING CASE STUDY OF INTRACRANIAL HEMORRHAGE IN AN INFANT**Himani Asani\*<sup>1</sup>, S. Parimalakrishnan<sup>1</sup>, Guru Prasad Mohanta<sup>1</sup>, S.Ramesh<sup>2</sup><sup>1</sup>Department of Pharmacy, Annamalai University, Annamalai Nagar<sup>2</sup>Department of Pediatrics, Rajah Muthiah Medical College Hospital, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu, India 608002**\*Corresponding author e-mail:** [himanasani@gmail.com](mailto:himanasani@gmail.com)**ABSTRACT**

Intracranial hemorrhage is bleeding within the skull cavity (cranium) that usually progresses rapidly and often results in permanent brain damage and death. The incidence of intra cranial hemorrhage in infants is rare. Here we are presenting a rare case of intracranial hemorrhage in which infant developed fever, seizures, vomiting after 45 days of immunization. A 2 months old male infant was brought to the pediatric casualty with chief complaints of 6 episodes of seizures for one night, fever for last 4 days and vomiting immediately after breast feeding since 2 days. Baby was apparently normal before the baby was brought for immunization (DT, OPV), the baby developed the above complaints after the immunization. In the past there were also similar complaints at time of birth. Baby was on anticonvulsant drug, phenobarbital, since seizure occurrence was found with the help of electroencephalogram. The CT scan report have showed, left front to back subdural hygroma with left frontal, temporal, parietal intracranial hemorrhage (ICH). There was a shift in the midline, which was toward right side of the brain with the association of inter hemispherical bleed along hygroma. Treatment was initiated with anticonvulsant, phenobarbital, antibiotics cefotaxime and amikacin and antipyretic paracetamol and loop diuretic, furosemide, was also administered with peripheral vasodilator and cerebral activator, nimodipine. We conclude that (1) In all difficult deliveries, the baby should be screened for intracranial hemorrhage by doing neurosonogram (2) early recognition of intra cranial hemorrhage is of paramount importance for initiating appropriate management to prevent complications and (3) early diagnosis and prompt therapy will lead to complete recovery.

**Keywords:** Intracranial, Hemorrhage, Hygroma, neurosonogram**INTRODUCTION**

Intracranial hemorrhage is bleeding within the skull cavity (cranium) that usually progresses rapidly and often results in permanent brain damage and death.<sup>[1,2]</sup> Bleeding that occurs between the inner surface of the skull and the outer membrane of the meninges (dura mater) is called epidural hemorrhage.<sup>[3]</sup> Subdural hemorrhage is bleeding that occurs between the dura mater and the middle membrane of the meninges (arachnoid).<sup>[4,5]</sup> Subarachnoid hemorrhage is bleeding that occurs between the arachnoid and the innermost membrane of the meninges (pia mater), in the space that is normally occupied by cerebrospinal fluid (CSF). Primary subarachnoid hemorrhage refers to

hemorrhage within the subarachnoid space that is not secondary to extension from subdural, intraventricular or cerebellar hemorrhage.<sup>[6]</sup> Intracerebral hemorrhage is bleeding within the brain. Color Doppler ultra sound may be used to characterize extra cerebral fluid collections as subarachnoid, subdural or combined. Correlation with MRI and CT suggests that Color doppler is reliable in making this differentiation. Intracranial hemorrhages in asymptomatic neonates may be common after vaginal birth, though reports on the use of color Doppler ultrasound are rare.<sup>[7-9]</sup>

In general, MRI is considered to be less sensitive for the detection of acute ICH than CT. However in the new born all significant hemorrhages seen in CT are

usually demonstrated by MRI. On MRI the signal intensity of blood varies with age.<sup>[10]</sup>

## CASE PRESENTATION

**History:** A 2 months old male infant whose observed weight of 4kg (Expected weight 4.5kg) was brought to pediatric casualty of Rajah Muthiah Medical College Hospital on 7/10/09 with chief complaints of six episodes of seizures since the previous night, fever since 4 days, vomiting immediately after breast feeding since 2 days. Baby was apparently normal 4days back when the baby was brought for immunization (DT,OPV) on 2/10/09 following which baby developed, fever for 4 days (high grade which relieved temporarily on medication). Seizures since previous night involving right upper and lower limb lasting for 5-10 min with upward rolling of eye balls, lip smacking, fluttering of fingers and drooling of saliva from mouth. There was recurrent episode of seizures (6 episodes) within last 24 hrs.

There was no history of trauma, loose stools/ ear discharge and neck stiffness. Patient was passing urine adequately. In the patient's past history there were also similar complaints during time of birth. Baby was on anticonvulsants of syrup phenobarbital. EEG was done which showed seizure activity. Infant mother's pregnancy was confirmed by HCG test, she was adequately immunised. No history of gestational diabetes mellitus, pregnancy induced hypertension, quickening felt at 5<sup>th</sup> month. Ultrasonogram was done at 5<sup>th</sup> and 8<sup>th</sup> month. It was a normal vaginal delivery with episiotomy. Baby didn't cry after birth for 30 minutes. Baby had hypoxic ischemic encephalopathy. Baby developed 1<sup>st</sup> episode of seizure after birth and developed 2<sup>nd</sup> episode of seizure within 24 hrs of birth. Baby was admitted in NICU. On viewing family history the infant's parents was a consanguineous marriage. Baby had developed social smile at 2 months and immunisation history was BCG given at birth, OPV& DT were given followed by fever and seizures.

On clinical examination anterior fontanelle was open and no abnormality detected. No pallor, cyanosis, icterus and oedema. Baby color was pink and Cry activity was poor. Central nervous system reflex and tone were poor. Heart rate was 140 per minute and respiratory rate was 70 per minute.

## CT SCAN REPORT:

- Left front to back subdural hygroma with left frontal, temporal, parietal intracranial hemorrhage (ICH).
- Midline shift to right.

- Inter hemispherical bleed with hygroma.

## DIAGNOSIS: Intracranial Hemorrhage

**Treatment and Results:** Treatment was started on 7/10/09 with the anticonvulsant Inj. phenobarbital 20mg by intravenous as a loading dose and maintenance dose of Inj. phenobarbital 10mg by intravenous for twice a day and antibiotics Inj. Cefotaxime 270mg iv TDS and Inj. Amikacin 30mg iv BD and antipyretic syp. Paracetamol (125mg/5ml) 2.5 ml (sos). They continued the same medications on 8/10/09. On 9/10/09 at 6am- 1episode of convulsion involving right upper limb lasting for 2-3min (tonic clonic seizure) occurred then a pre operative sedative Inj. Midazolam (5mg/ml) 0.5ml iv stat and anti convulsant Inj. Phenytoin 80mg iv std in dilution (a loading dose) and Inj. Phenytoin 10mg iv BD, osmotic diuretic Inj. Mannitol (5mg/kg) 2.5ml iv TDS stat were given, subdural tapping was done on under strict aseptic conditions. 20ml of tapping fluid was taken then patient was moved to PICU for observation and child was responded to painful stimuli. After subdural tapping Inj. Cefotaxime 270mg iv TDS and Inj. Amikacin 30mg iv BD and Inj. Phenytoin 10mg iv BD, oxygen 4lt/min were given. Blood transfusion was done and the infant did not develop any immunoglobulin reactions.

On 10<sup>th</sup> of October 2009 in the early hours of morning there was one episode of convulsion involving right upper limb (pin roll movement) occurred then administered Inj. Phenobarbital 10mg iv stat. After one hour the child had one more similar episode of convulsion. The patient was given Inj. Cefotaxime 270mg iv TDS and Inj. Amikacin 30mg iv BD , a pre operative sedative Inj. Midazolam (5mg/ml) 0.5ml iv stat, Inj. Phenytoin 10mg iv BD, Inj. Mannitol (5mg/kg) 2.5ml iv TDS stat, loop diuretic Inj. Furosemide 4mg iv OD , peripheral vasodilators and cerebral activator T. Nimodipine (30mg) 2.5 mg OD. For the following ten days physicians had prescribed the same medication.

Following medicines were prescribed at the time of discharge to the patient, Inj. Phenobarbital 10mg iv, Inj. Phenytoin 10mg iv BD, Inj. Mannitol (5mg/kg) 2.5ml iv TDS stat, Inj. Furosemide 4mg iv OD, T. Nimodipine (30mg) 2.5 mg OD. And the CT scan report showed hyperdense lesion seen in the left frontal region measuring 20x10x11mm of haematoma volume (HV) 50IU. Perilesional oedema was also seen. Another hyperdense lesion seen in left parietal region measuring 10x12x10mm with perilesional oedema and subdural hematoma.

The patient was advised to come for review after ten days from the day of discharge, then CT scan was done and the report showed the presence of hypodense lesion in left frontal as well as in parietal region and the size was found to be 23x22x30mm of HV value 7IU. The lesion showed that there was a ring enhancement with HV value 22IU. Another hypodense lesion was observed in left temporal

region with the HV value 5IU. During the second review after 2 years, once again CT was done and that report showed planogram, postfossa, orbit and sinuses are normal. Cerebrum – cortical atrophy on left side with gliotic changes were seen in frontal and parietal region having HV 3IU associated with ventriculomegaly.

**TABLE 1: LAB INVESTIGATIONS <sup>[11]</sup>**

<b>Investigation</b>	<b>Value</b>	<b>Normal Range</b>
Serum sodium	138 mmol/l	136-145 mmol/l
Serum potassium	5.9 mmol/l	3.5-5.0 mmol/l
Serum chloride	110 mmol/l	96-106 mmol/l
Heamoglobin	5.2 g/dl	14-18 g/dl(males) 12-16 g/dl(females)
RBC	1.48 million/mm <sup>3</sup>	4.8-7.2 million/mm <sup>3</sup>
Subdural CSF		
Sugar	67 mg/dl	45-75 mg/dl
Protein	250 mg/dl	15-45 mg/dl
Chloride	103 mg/dl	120-130 mg/dl

## REFERENCES

1. Gershon, Abner, Robert Feld, Michael T. Twohig. "Subarachnoid Hemorrhage." *eMedicine*. Eds. Hugh J. Robertson, et al. Medscape, 21(5); 2009.
2. Liebeskind, David S, "Intracranial Hemorrhage." *eMedicine*. Jeffrey L.Saver et al, Medscape, 27(4); 2009.
3. Biros MH, Heegaard WG, Head Injury.In: Marx JA, Editor. Rosen's Emergency Medicine: Concepts and Clinical Practice 7<sup>th</sup> ed., Philadelphia, Pa: Mosby Elsevier; 2009: Chap 38.
4. Whitby EH, Griffiths PD, Rutter S, et al. Frequency and natural history of subdural hemorrhages in babies and relation to obstetric factors. *Lancet*, 2004; 363: 846 – 851.
5. Greenberg MS. Handbook of neurosurgery, 7<sup>th</sup> Ed., Canada; Thieme Medical Pub: 2010 .896-97
6. Joseph J. Volpe, Neurology of the new born, 5<sup>th</sup> ed., Saunders Elsevier: 2008.493-94
7. Looney CB, Smith JK, Merck LH, Wolfe HM, Chescheir NC, Hamer RM. *Radiol*, 2007; 242(2): 535-41.
8. Chen CY, Chou TY, Zimmerman RA, Lee CC, Chen FH, Faro SH. *Radiol*, 1996; 201(1): 389-92.
9. Lowe LH, Bulas DI. *Pediatric Radiol*, 2005; 35(1): 54 – 65.
10. Taesch Ballard Gleason. Avery's diseases of the newborn. 8<sup>th</sup> Ed., Saunders Elsevier: 2005.917-922
11. Mary Lee. Basic skills in interpreting laboratory data. 4<sup>th</sup> Ed., 2009: 584 – 558.