

Clinical Outcome in Neonates with Polycythemia

Dr Sravya Vemulapalli¹, Dr G. Kalyan Chakravarthy², Dr Chandrasekhara Reddy M³

¹Junior Resident, GSL Medical College & General Hospital, Rajamahendravaram

²MD, Professor, GSL Medical College & General Hospital, Rajamahendravaram

³Junior Resident, GSL Medical College & General Hospital, Rajamahendravaram

Abstract: **Introduction:** Neonatal polycythemia is the principle cause of hyperviscosity of blood in newborn and has been associated with serious, sometimes life threatening insults to the brain, heart, kidney, lungs and intestines. **Aims & Objectives:** To study the incidence & clinical outcome of polycythemia among inborn babies of GSL general hospital. **Results:** The incidence of polycythemia was 2.28%. Among the polycythemic babies (13 babies), term babies constituted 77.4% and small for gestation babies 54.8%. Lethargy (61.3%) was the predominant symptom followed by poor feeding (38.7%). The predominant laboratory abnormalities were hypoglycemia (32.3%) & thrombocytopenia (22.6%). **Conclusion:** Polycythemia is a silent clinical entity which if unrecognized can result in significant morbidity. Close monitoring is necessary as clinical features in polycythemia may be subtle and babies may be asymptomatic.

Keywords: Neonatal polycythemia, Hyperviscosity, Hematocrit, Partial exchange transfusion

1. Introduction

Polycythemia and secondary hyperviscosity are common problems in the newborn period with reported incidence ranging from 1% - 5% in total newborn population. Polycythemia is defined as presence of a venous hematocrit more than 65% or a venous hemoglobin concentration in excess of 22.0 gm/dL. Hematocrit (%) is approximately three times the hemoglobin concentration in gm/dL. As the viscosity increases, there is an impairment of tissue oxygenation and perfusion and a tendency to form microthrombi. Secondary hyperviscosity may have lasting effects on brain, heart, kidneys and intestines and approximately 40% of babies have long term neurological and developmental sequelae. Early diagnosis and treatment of neonatal polycythemia is therefore of great importance

2. Aims & Objectives

To determine the incidence of polycythemia among inborn babies of GSL general hospital, to describe the clinical features and laboratory abnormalities in neonatal polycythemia.

3. Materials & Methods

Study Design: Prospective observational study.

Study Setting: GSL Medical College and General Hospital, Rajahmundry.

Study Size: A total number of 600 inborn babies

Study Period: 6 months (July 2018- December 2018)

Criteria for exclusion: delayed cord clamping, holding the baby below the level of mother's introitus, cord milking/stripping.

Babies were screened for neonatal polycythemia at 2 to 4 hours of postnatal age using venous hematocrit. Babies were considered polycythemic if the venous hematocrit >65%. A repeat hematocrit was performed at 12 hours (or at any age if

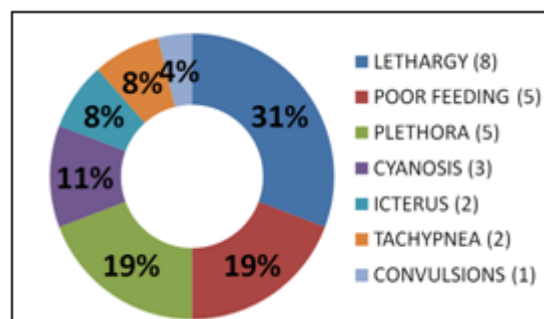
symptoms appeared) if the initial hematocrit was high. All neonates were examined and the polycythemic babies were categorized as symptomatic and asymptomatic.

Particular attention was given to the presence of signs and symptoms attributable to polycythemia. Lethargy, poor feeding, plethora, cyanosis, convulsions, icterus, tachypnea, etc., were looked for. The following investigations were sent for all polycythemic babies Hb (gm/dl), platelet count (per/mm³), Blood glucose (mg/dl), serum calcium (mg/dl), serum total bilirubin (mg/dl)

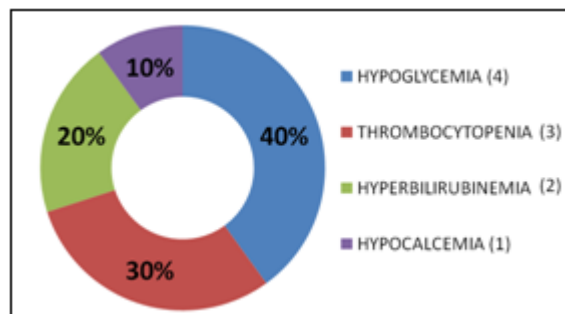
4. Results

Total number of babies studied 600 out of which 13 babies were polycythemic. The incidence of polycythemia was 2.16% .

- Among the polycythemic babies (13 babies),
- Term babies constituted 77.4%, post term (8%) & preterm babies (15%).
- 8 out of 13 babies were symptomatic, 5 were asymptomatic.



- Lethargy (61.3%), poor feeding (38.7%) plethora (38.7%)
- The laboratory abnormalities were hypoglycemia (32.3%), thrombocytopenia (22.6%), hyperbilirubinemia (19.35%), hypocalcemia (6.5%).



5. Discussion

In symptomatic babies, septicemia was excluded by negative sepsis screen (total leucocyte count, ESR, CRP) and blood culture. Lumbar puncture was done in case of convulsion to rule out meningitis and cranial ultrasound was done to rule out any structural anomalies of the brain.

Partial exchange transfusion was performed for following babies

- Those babies with venous hematocrit >65% with symptoms.
- Those babies with venous hematocrit >70% without symptoms.

Asymptomatic babies with venous hematocrit 65 to 70 % were only observed.

The volume for partial exchange transfusion was calculated using the formula-

$$\frac{(\text{observed hematocrit} - \text{desired hematocrit}) \times \text{wt (kg)} \times \text{blood volume (ml/kg)}}{\text{observed hematocrit}}$$

Desired hematocrit was taken as 55%, Blood volume taken as 80ml/kg.

Partial exchange transfusion was done through two peripheral veins. Blood was allowed to drip out freely through a vein using 21-22 gauge disposable needle/cannula while simultaneous infusion of fluid (normal saline) was carried out through another peripheral vein. Babies were monitored throughout the procedure.

Immediate post exchange hematocrit was done using venous blood. Babies were followed up clinically and repeat hematocrit done at 12 hrs of age.

Effectiveness of partial exchange transfusion was assessed by its efficacy to bring down the hematocrit to desired levels and to maintain it at normocythemic levels and also the improvement in the signs and symptoms of polycythemia.

6. Conclusion

Polycythemia is a silent clinical entity which if unrecognized can result in significant morbidity. Hence, high index of suspicion is necessary and babies with known risk factors should be actively screened for this condition.

Close monitoring is necessary as clinical features in polycythemia may be subtle and babies may be

asymptomatic. PET should be considered in symptomatic babies with hematocrit >65% and asymptomatic babies with venous hematocrit >70%. Asymptomatic babies with venous hematocrit 65-70% should only be observed.

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