

## **Missed and Delayed Diagnosis of Neonatal Meningitis**

I read with interest the recent article by Udani V, *et al.*(1). Based on a well-conducted retrospective study on infants presenting with hydrocephalus, they conclude that neonatal meningitis/ventriculitis remains undiagnosed in about a third of newborns with this condition. However, I would like to make certain observations.

Hydrocephalus is but one of the several sequelae of neonatal meningitis (NM). Other common sequelae include mental retardation, seizures, and sensorineural hearing loss(2). Therefore, studying cases of hydrocephalus alone may not reflect a true picture of unrecognized NM and figures thus obtained may under-estimate the proportion of missed cases. In fact, in the present series too, 4/13 infants presenting with hydrocephalus had seizures also. Further studies are required to determine the proportion of cases of infantile seizures where unrecognized NM could be a contributing factor.

There could be various factors that lead to a missed diagnosis of NM. Authors highlight the problem of inadequate antibiotic administration (less than three weeks) for suspected "sepsis", resulting in only partial treatment of meningitis. Other reason could be the absence of classical symptoms and signs of meningitis. It was observed that dyspnea was the commonest clinical manifestation among newborns presenting with meningitis before seven days of age, whereas fever and diarrhea were the commonest manifestation among those

presenting after seven days(3). In the current series too, about 60% of infants did not have usual symptoms of infection.

Lumbar puncture (LP) is not routinely performed in evaluation of early neonatal sepsis due to several factors such as that it is an invasive procedure, it may compromise respiratory function, and interpretation of cerebrospinal fluid analysis may not always be straightforward(4). However, omitting LP could result in delayed or missed diagnosis of NM in about 40% of cases(5). Therefore, LP should be included in evaluation of all high-risk newborns presenting with sepsis.

Authors report a poor outcome in majority of their cases of NM with hydrocephalus. Seven of 11 (63%) patients for whom follow up data was available had a severe disability. Delayed diagnosis and inadequate treatment, according to the authors, is responsible for this. However, due to a "retrospective hospital-based" nature of this study, it is likely that patients with favorable outcomes did not return to the hospital. Small sample size is a further limitation to this conclusion.

In conclusion, the current study has convincingly highlighted that NM is commonly undiagnosed or diagnosed late. This could be a significant factor leading to a higher morbidity and mortality in this group of newborns. LP should be performed in all high-risk cases with neonatal sepsis to avoid missing NM.

**Kumar S.,**

*Neurology Unit,*

*Department of Neurological Sciences,*

*Christian Medical College Hospital,*

*Vellore, Tamilnadu-632004,India.*

*E-mail: drsudhirkumar@yahoo.com*

**REFERENCES**

1. Udani V, Udani S, Merani R, Bavdekar M. Unrecognized meningitis / ventriculitis presenting as hydrocephalus in infancy. *Indian Pediatr* 2003; 40: 870-873.
2. Stevens JP, Eames M, Kent A, Halket S, Holt D, Harvey D. Long term outcome of neonatal meningitis. *Arch Dis Child Fetal Neonatal Ed.* 2003; 88: F179-184.
3. Chang Chien HY, Chiu NC, Li WC, Huang FY. Characteristics of neonatal bacterial meningitis in a teaching hospital in Taiwan from 1984-1997. *J Microbiol Immunol Infect.* 2000; 33: 100-104.
4. McIntyre P, Isaacs D. Lumbar puncture in suspected neonatal sepsis. *J Paediatr Child Health.* 1995; 31: 1-2.
5. Wiswell TE, Baumgart S, Gannon CM, Spitzer AR. No lumbar puncture in the evaluation for early neonatal sepsis: will meningitis be missed? *Pediatrics.* 1995; 95: 803-806.

---

## **Does Arsenic Consumption Influence the Age at Menarche of Woman**

The people of nine districts of West Bengal surrounding 38,865-km<sup>2</sup>(1) are facing several problems due to the consumption of arsenic, as arsenic contaminated groundwater is being used for drinking purpose, agriculture, cooking of food and washing of utensils. It is established by several authors that constant exposure to arsenic is associated with cancer of skin, lungs, bones, kidneys, liver, bladder *etc.* (1,2). It also depletes body stores of iron, vitamin C and other essential nutrients leading to intrauterine growth retardation, decreased immune defenses and disabilities associated with malnutrition(3). Therefore, theoretically there arises a possibility that the use of arsenic poisoning water for a long time may affect the age at menarche (AGM) as it has a definite correlation with malnutrition. Therefore, the present communication attempts to determine whether an association exists between arsenic and AGM.

The present sample consists of 385 females (15-20 years) out of which 175 girls are from arsenic affected area of Ashokenagar and Basirhat in the district of north 24-Parganas, West Bengal, where the tube-wells were marked by the government as containing arsenic-water above permissible dose (0.05 mg/liter). But the villagers are still using this water (for 10-12 years) due to lack of alternative water supplies. However, control data (210 girls) was collected from a non-arsenic area (Guma) of the same district, after matching some conditions (social status, monthly income, education, food habits, family size, living conditions and birth rank of the subject). Printed questionnaires were used to collect information. Statistical comparisons were carried out through the use of  $\chi^2$ -test and student's t-test.

Both affected and non-affected groups are from Bengali Hindu family, mostly engaged in agriculture having lower socio-economic strata and protein-poor diet. According to economic condition, each group was divided into three categories- high (>2000), medium (1000-2000) and low (<1000). 81.71% of affected and 77.62% of non-affected girls are illiterate and others are in school standards.