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PREVENTION OF EPILEPSY

Prevention of epilepsy and obstetric care

Sanjeev V THOMAS

Department of Neurology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, India

Perinatal factors have long been considered one of the important risk factors of epilepsy. However it is difficult to draw firm conclusions because the results from different studies do not agree with each other. Several groups have reported that about 20-30% of persons with epilepsy would have a possible perinatal risk factor.[1-7] Hauser and colleagues had examined the case records of the Mayo Clinic and reported a prevalence rate of 5.8% for antenatal and perinatal causal factors for epilepsy.[8] Degan and colleagues in a hospital based case control study (422 cases and 150 controls) had observed that advanced age of mother, previous miscarriages, Preeclampsia or eclampsia, bleeding during current pregnancy, post maturity, low birth weight for the baby and asphyxia at birth carried increased risk of epilepsy in the offspring.[9]

FOLLOW UP STUDIES

National Collaborative Perinatal Project is a large study that had recruited over 54,000 infants in 1959 and followed up over two decades. Ellenberg and Nelson had reported on the follow up of these children until the age of seven years.[10] They had concluded that labor and delivery factors appeared to contribute very little to childhood seizure disorders. Maldevelopment, rather than damage at birth to an initially intact nervous system, appeared to be the more common mechanism.[11] Tsuboi and Okada[12] had followed up 17044 children aged 3 years. One or more exogenous factor was present in 27% of the affected group, which differed little from that for the control group (25%). A prospective follow up of 12,058 children in Finland had yielded 208 children with epilepsy.[13] Prenatal factors carried the highest relative risk (20) for all subtypes of epilepsies. The relative risk for perinatal (2) and postnatal (6) factors was lower. British national child development study had enrolled 17,414 of infants born in Great Britain between 3 and 9 March 1958. When followed up at 23 years of age there were 124 persons (cumulative incidence 8.4 per 1000) with epilepsy. No specific obstetric risk factors were identified in this series.[14]

CASE CONTROL STUDIES

Rocca *et al* had screened all case records of Rochester Minnesota between 1935 and 1979 had identified 53 incident cases of generalized tonic clonic seizures and 82 incident cases of complex partial seizures with age of onset less than 30 years.[15,16] Seizures associated with cerebral palsy were excluded. None of the commonly suspected perinatal factors were significantly associated with occurrence of GTCS or CPS in the offspring. An incident case control study of GTCS in Italy had found that family history of epilepsy, febrile seizure, other perinatal factors, (continuous physical activity during pregnancy, maternal age > 35 years, birth order >3) were significantly more common in patients as compared with controls.[17] In a subsequent paper the same authors[18] had reported on the lack of any association between partial epilepsy and previously suggested risk factors. An incident case control study from Sweden showed that on univariate analysis, the risk of unprovoked afebrile seizure was significantly elevated for later birth order, vaginal bleeding, onset of hypertension during pregnancy, cesarean section, short or long gestational age and Apgar score six or less. A combination of two or more risk factors had pronounced risk. In the multivariate analysis only vaginal bleeding, gestational age and cesarean section remained statistically significant. For the first time, smoking during pregnancy was recognized as a risk factor for unprovoked seizures.[19]

Address correspondence to: Dr Sanjeev V Thomas, Department of Neurology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum 695011, India. Phone + 91 471 2524468, Fax + 91 471 2446433, Email: sanjeev@sctimst.ker.nic.in

INTRAUTERINE INFECTIONS

Intrauterine infections are important causes of fetal loss and severe congenital malformations involving heart and nervous system. Toxoplasma, rubella, cytomegalovirus (CMV) and herpes are common pathogens implicated intrauterine infections particularly in developing countries. In a series of infantile spasms reported from Finland, 10% of the cases were caused by one of the TORCH etiological agents. Infantile spasm associated with infections seem to have poorer prognosis.[20] Perez-Jimenez and colleagues have described ten cases of congenital CMV infection associated with a variety of neuronal migration disorders and epilepsy.[21] The cortical developmental disorders included agyria-pachigyria, poligyria, schizencephaly and bilateral opercular dysgenesis. These observations indicate that congenital infections can lead to developmental pathology associated with epilepsy.

ASIAN DATA

No prospective case control study had been reported from Asia except Japan. Perinatal encephalopathy accounted for 40% of the epilepsies in children less than 5 years of age (21% of over all etiology) in a hospital based prevalence study from Saudi Arabia.[22] A history of perinatal complications, low BMI and recent physical symptoms were independently associated with active epilepsy in a community survey for epilepsy among 8-12 year old children.[23] No causal association between reproductive factors and epilepsy was demonstrated in community based case control studies from Bengal and Chandigarh.[24,25] Kalra *et al* had reported that 66% of their series of Infantile Spasm had a pre or perinatal etiological factor.[26] In another series of infantile spasm from Japan 39 patients (83%) had symptomatic infantile spasm, in which the prenatal causes were most frequent, followed by low-birth weight (LBW) infants, perinatal and postnatal.[27]

Most studies indicate that close to a third of persons with epilepsy may have one or more perinatal insult that could potentially cause epilepsy. Smaller case series and some of the larger studies had suggested that these factors carried an excess risk for epilepsy. But most of the larger cohort follow up studies such as the NCPP, NCDS, and Rochester series failed to demonstrate any causal relationship between maternal obstetric factors or early neonatal factors and risk for development of epilepsy. However, a couple of recent incident case control studies have again shown an increased risk of afebrile seizures associated with antenatal obstetric factors. It appears that the risk factors may differ for different seizure types. There could be a high-risk group where in obstetric factors might be playing a more important causal role. Infantile spasm, epilepsy associated with mental retardation, cerebral palsy and intrauterine infections probably belongs to this category.

PREVENTION

WHO and ILAE have estimated that nearly 10% of incident epilepsy is potentially preventable. It is regrettable that only 68% of women in developing countries avail at least one antenatal check up when WHO recommends four mandatory antenatal check ups. Some 30% and 65% of those who live in rural areas and uneducated do not receive any antenatal check up at all. With regard to delivery, 60% of all deliveries in developing countries are not attended by any trained personnel, leave alone doctors or midwives.

We know that different epileptic syndromes can cause same seizure types. Mesial temporal sclerosis as well as a ganglioglioma of the temporal lobe can cause indistinguishable complex partial seizure. We need further studies that explore the obstetric risk for different epileptic syndromes rather than different seizure types.

It is imperative that the antenatal and obstetric services are strengthened in the community. It is not enough to establish more antenatal and obstetric services in the community. It is necessary to make it affordable to those who cannot afford it and campaign to encourage women to avail them. Control and prevention of antenatal infections need to be priority areas for prevention of epilepsy. Appropriate screening facilities need to be established for this purpose. It is also important to improve the neonatal care services in order to reduce the risk of neonatal convulsions and epilepsies in general.

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