Double Aneuploidy with Down Syndrome

Robertsonian translocations (RT) are one of the most common structural reorganizations with an incidence of 1/1000 newborns(1). The most prevalent heterologous RT is der(13;14) which makes up ~75% of all RT with an incidence of 0.97/1000 in newborn carriers, reaching frequencies up to nine times higher in infertile males(2).

The risk of unbalanced karyotype resulting from RT in spermatozoa lies between 3-27% depending on the specific chromosome involved in the translocation(3). The der(13;14) increases the risk of trisomy 13 to <2.7% in the 2nd trimester to <0.6% at live birth, trisomy 14 to 0.4% and raise the risk of spontaneous abortions to 20-22%(4). It has also shown an increased risk of trisomy of other chromosomes not involved in the translocation due to "interchromosomal effects"(1).

A young couple of non-consanguineous marriage approached for prenatal evaluation during their 4th pregnancy. Previously, they had two first trimester abortions and a child portraying clinical features of Down syndrome like flat nasal bridge, short neck, narrow palate, bilateral simian crease, epicanthic folds, small ears and open mouth. Chromosomal analysis of amniotic fluid fibroblast study revealed RT involving chromosome 13 and 14. To rule out *de-novo* origin of the translocation, the parents and the first child were karyotyped. It was found that the father is a balanced translocation carrier, 45,XY,der(13;14)(q10;q10) and the fetus had inherited RT from its father. The sibling was found to have double aneuploidy with karyotype, 46,XY,der(13;14)(q10;q10)pat,+21. The maternal karyotype is normal.

In this case, all the chromosome 21 present in the proband showed unusually long and typical satellite and hence, chromosome 21 satellites was used as a marker and the pattern compared with the parental chromosome 21, which confirmed the additional chromosome 21 to be of paternal origin. This could be due to "interchromosomal effect". The chromosome 21 consistently showed a higher disomy frequency (0.22-0.55%) than other autosomes tested in translocation carriers(5). This signified that a translocation of chromosomes may lead to abnormal segregation of a chromosome not involved in the translocation during meiosis.

Hence, it is recommended to do a full karyotype in addition to FISH and it is also necessary to do karyotype in the previously affected child, before doing prenatal diagnosis. Thus, a couple in which one of the partners is a carrier of a balance translocation, genetic counseling is needed to discuss the fertility problems and the increased risk of a trisomy/monosomy of the translocated chromosome. One also needs to counsel them about the increased 1% additional risk of conceiving a trisomic child other than the chromosomes involved in the translocation.

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Suppression of Brainstem Reflexes in Snakebite

We report a 12–year old boy, who was admitted in our hospital with history of snake bite over left side of pinna, while he was sleeping on the floor in the house during night. Child was immediately brought to hospital. He had one episode of vomiting on way to the hospital. On examination, he was drowsy and having insufficient respiratory efforts. The pulse rate was 56/min, BP was 90/60 mm of Hg and SPO_2 was 70% with 3L/min O_2. He had ptosis and sluggish deep tendon reflexes with absent plantar. Child was immediately intubated and kept on ventilator. Polyvalent antisnake venum and neostigmine were started as per the standard protocol on snake bite.

Over a period of about 6 hours, child became areflexic. Pupils were dilated and not reacting to light. Corneal and occulocephalic reflexes were absent. There were no spontaneous respiratory efforts and apnea test was negative. Ventilatory support continued despite finding suggestive of brain stem dysfunction. The child was showing some movements of hands and feet on the next morning. In the evening, spontaneous respiration was present. Child was weaned off from ventilator after 72 hours and discharged after 5 days.

The snakes most commonly associated with mortality in India are cobra (*Naja naja*), krait (*Bungarus caeruleus*), Russel's viper (*Vipera russelli*) and saw scalled wiper (*Echis Carinatus*)(1). Although snake bite is a frequently encountered problem in rural and tribal areas, it is infrequently seen in urban Surat. Common neurotoxic snake include cobra and krait. Krait bites are commonly reported during night, and those sleeping on the floor are at greater risk (2).

Venom from neurotoxic snake has a curare like effect by blocking neurotransmission at neuro-muscular junction. Cobra venom acts post synaptically while krait venom acts pre synaptically(3).

ASV is most effective when administered within a few hours of krait bite. Ventilator support forms a cornerstone of krait envenomation therapy. Anticholinesterase (neostigmine) had been tested and no benefit was found in reversing paralysis in common krait bite(4).

This case highlights that potential reversible causes of brain death must be excluded before diagnosis of brain death. Electrocerebral silence on EEG for at least 30 minutes and absence of blood flow in 4 vessels cerebral angiography are confirmatory test for brain death(5).

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