



Brief communication

Can Down syndrome cause persistent non-reactive non-stress test?

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Non stress test (NST), the most commonly used modality for fetal surveillance, is regulated by the fetal central nervous system (CNS). The presence of reactive NST is an indirect evidence of mature and functioning CNS. The physiologic non-reactivity at early gestation confirms the presence of maturational effect on the relationship between fetal heart rate and body movements with increasing gestation [1]. Down syndrome is characterized by mental retardation and delayed developmental milestones. Down syndrome children appear to have a CNS, which remains rather immature despite the advanced chronological age [2]. Similar to the delay in post-natal developmental milestones, these fetuses in-utero may have late onset of reactivity to NST. We have observed persistently non-reactive NST in 4 fetuses who were

found to have trisomy 21 after birth. The details of the 4 cases are tabulated in Table 1.

The patient with low maternal serum alpha fetoprotein (MSAFP) refused the confirmatory test. All patients had mild fetal growth retardation. The NSTs were persistently non-reactive beyond 32 weeks, but biophysical profile (BPP) was normal in each case. All of them delivered fetuses with trisomy 21 confirmed on chromosomal analysis.

Non-stress test (NST) is a biophysical test for fetal surveillance which depends upon the CNS integrity and maturity. As Down syndrome children often have brain with maturational delay, it is possible that NST will become reactive later in gestation in these fetuses compared to normal. The objective evidence of delayed maturity of brain in Down syndrome is the presence of gross morphologic alterations in the brain and delayed myelination, as demonstrated on MRI [2,3].

Navot et al. (1984) reported the occurrence of

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Table 1
Pregnancy outcomes in four patients with persistent non-reactive NST^a

Patient no.	Maternal age (in years)	MSAFP	Antenatal complications	Delivery and gestational age	Birth weight (kg)	Apgar score
1	31	Not done	Severe PIH oligohydramnios	CS at 34 weeks	1.4	6/10
2	26	Normal	Mild IUGR	CS at 35 weeks	2.01	9/10
3	37	Low	Mild IUGR	VD at 38 weeks	2.6	9/10
4	22	Not done	Mild IUGR	VD at 37 weeks	2.1	9/10

^aAbbreviations: CS: cesarean section; VD: vaginal delivery; IGR: intrauterine growth retardation; and PIH: pregnancy-induced hypertension.

non-reactive NST in five out of six cases of trisomies (5-trisomy 21 and 1-trisomy 18) [4]. However, he did not mention the absence of associated fetal distress confirmed by other tests like BPP or persistence of non-reactivity in these patients.

It is possible that NST may remain non-reactive till term in Down's fetuses as seen in two cases. Since the delivery was preterm in another two cases, it is difficult to say whether NST would have become reactive later in gestation. This aspect of NST reactivity in Down syndrome needs to be explored further as it will determine whether persistent non-reactive NST is indicative of the presence of Down syndrome in the fetus.

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