Heart Screen Could Prevent 15% of SIDS Cases

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NEW ORLEANS — An estimated 12%-15% of cases of sudden infant death syndrome are caused by the long QT syndrome, Marianne Arnestad, M.D., reported at the annual meeting of the Heart Rhythm Society.

These arrhythmic SIDS deaths are preventable through early identification of children with long QT syndrome (LQTS) and initiation of preventive therapy. It therefore becomes "imperative" for physicians to screen all neonates for a prolonged QT via an ECG, with follow-up confirmatory genetic testing for LQTS in those with suspicious findings, said Dr. Arnestad of the University of Oslo.

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She and her coinvestigators, including a group headed by Peter J. Schwartz, M.D., at the University of Pavia (Italy), screened neonatal ECGs from 34,000 babies. They identified 1 per 2,000 as having a prolonged QT interval, with the diagnosis of LQTS then being confirmed by genotyping.

Next, the investigators embarked on a blinded study of DNA samples obtained from confirmed SIDS cases and control children who died of accidents or infection. To date in this ongoing project, a mutation in one of the main LQTS ion channel genes has been found in 10.5% of 152 SIDS cases and none of 34 controls. Of the 16 LQTS SIDS cases, 8 featured a mutation in *SCN5A*, 6 in *KCNH2*, and 2 in *KCNQ1*.

It's important to bear in mind, however, that collectively the currently available commercial and investigational molecular tests for LQTS remain unable to detect 35%-40% of all definitely affected individuals. This suggests the true prevalence of LQTS in SIDS is not 10.5%, but probably closer to 12%-15%, Dr. Arnestad asserted.

Ronald J. Kanter, M.D., a member of the Heart Rhythm Society's scientific program committee, said the channelopathies were clearly the biggest story in the field of pediatric and congenital heart disease at this year's meeting. Indeed, LQTS has become a red-hot research area. In addition to the major European study on LQTS and SIDS presented by Dr. Arnestad, another highlight was a report from investigators in Pavia, Boston, and Salt Lake City describing the phenotypic characteristics of a recently recognized variant of LQTS known as LQT8.

The disorder is phenotypically quite similar to LQT3. In the largest LQT8 patient series studied to date—20 children followed for up to 12 years—all of the subjects presented with remarkably prolonged corrected QT intervals; the mean was 600 milliseconds. This was often associated with 2:1 functional AV block and T-wave alternans, an electrical marker of high risk for sudden cardiac arrest. Extracardiac manifestations were extremely common. They included syndactyly of the hands and feet, specific facial features, and neuropsychiatric problems. Despite aggressive therapy, half of the children died at a mean age of 35 months, noted Dr. Kanter of Duke University, Durham, N.C.

Barbara J. Deal, M.D., also a member of the society's scientific program committee, said screening all neonates at 2-4 weeks of age in order to identify and intervene in those at risk for SIDS due to LQTS is an exciting prospect.

"Screening is going to become another costly public health issue, but one likely to be very fruitful," predicted Dr. Deal of Children's Memorial Hospital, Chicago.

Moreover, it's entirely possible that fetal screening may be useful, she added.

"In the human life cycle, the highest-risk period for sudden cardiac death is in the third trimester. That risk is around 1 in 500, which is four times greater than the rate of SIDS," she said.

Physicians collaborating in Chicago, Wisconsin, and St. Petersburg, Fla., have successfully employed 37-channel magnetocardiography to identify T-wave alternans in fetuses. By using echocardiographic techniques, they have also identified fetal torsades de pointes, which were then treated in utero with lidocaine. These are developments very much worth keeping an eye on, Dr. Deal said. ■