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Commentary

Congenital Cytomegalovirus screening in newborns: Current status in the United States

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Abstract

Targeted hearing screening for congenital cytomegalovirus (cCMV) with CMV polymerase chain reaction testing completed before 3 weeks of age for infants who fail newborn hearing screening is a reasonable option to improve cCMV related non-genetic sensory-neural hearing loss (SNHL). Universal cCMV screening using dried blood spots that is used on almost newborn infants has the potential to benefit those children at risk for SNHL and will be a great public health option.

Keywords: Congenital cytomegalovirus screening, Newborn, Sensorineural hearing loss

Commentary

Congenital Cytomegalovirus (cCMV) infection is the leading cause of non-hereditary sensorineural hearing loss (SNHL) and developmental delay in children with an approximate prevalence rate of 0.7% [1]. This prevalence may be an underestimate since 90% of affected infants are asymptomatic at birth and there is no universal newborn screening for cCMV. SNHL occurs in 30-40% of symptomatic infants and 5-10% of asymptomatic cCMV infants and it is estimated that cCMV accounts for 25-40% of total hearing loss in children [2,3]. National CMV foundation is at the forefront of advocacy efforts. CMV legislation has been passed in at least 12 states currently with additional states are in the process of doing so as per March 2021 report. Different states have used strategies of education, and/or targeted screening for cCMV. The educational efforts have been focused on educating women of childbearing age and/or healthcare professionals about congenital CMV [4].

A 'targeted screening' approach is being used in some locations in the USA. Utah was a pioneering state in this regard, where the targeted screening program was started in July 2013 for failed hearing test within 3 weeks of age. In January 2019, New York created a new law mandating cCMV screening for any failed newborn hearing screen (NHS). At our institution, we had used a multi-disciplinary team approach in 2018 prior to the implementation of law in our state using quality improvement methodology for an extended neonatal screening. The inclusion criteria were 1) Any symptomatic newborn with suggestive findings of cCMV such as small for gestation age – both asymmetric and symmetric, unexplained thrombocytopenia, hepatosplenomegaly, transaminitis, neurologic abnormalities such as, seizures, microcephaly, subependymal cysts or chorioretinitis, 2) Periventricular calcifications, 3) All infants who failed the NHS prior to discharge from the hospital [NHS could be Otoacoustic emission (OAE) and/or automated Auditory brainstem response (aABR). [5]. Our team showed that it is feasible to improve cCMV screening by implementing a standardized extended screening protocol using QI methodologies. Many medical centers are adopting hearing targeted early cCMV screening (HT-CMV). Such policies may be helpful, but still may miss significant number of delayed SNHL due to cCMV [6].

The diagnosis of cCMV in infants can be made by detecting the virus from a culture or CMV DNA polymerase chain reaction (PCR) of body fluids such as urine or saliva, respectively, within the first 3 weeks of life. Salivary CMV PCR, when positive, should be confirmed by urine CMV PCR [7,8]. CDC is evaluating whether dried blood spots (DBS), which are already collected on almost all newborns, can identify the majority of children who are most likely to suffer long-term health

problems from cCMV. Recent studies are showing much higher analytical sensitivity compared to past studies in diagnosing cCMV on DBS. This could potentially prove to be a low cost universal screening option in the years to come [9]. The Newborn Hearing Screening Working Group of the National Coordinating Center for the Regional Genetics Networks recommended that universal cCMV screening, along with limited genetic testing, be integrated into the current newborn hearing program, but such a program has not been implemented yet. [10]. Data from targeted screening show that the sensitivity of identifying cCMV may not be as good as universal screening, but this strategy identified 2/3rd of symptomatic cCMV cases [11]. Previous cost-effectiveness studies have proposed that both universal and targeted cCMV screening would be low cost or have increased cost savings if costs related to lost productivity were included [12].

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This commentary was written by me alone.

Conflict of Interest

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