Canadian Infant Hearing Task Force
Groupe de travail canadien sur l'audition des nourrissons

CMV CANADA

SAC Speech-Language & Audiology Canada
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Position Statement on Universal Congenital Cytomegalovirus Screening in Canadian Newborns

Position

It is the position of the Canadian Infant Hearing Task Force (CIHTF) and the Canadian CMV Foundation that universal screening for congenital cytomegalovirus (cCMV) in newborns be offered within the first 21 days of life in all provinces and territories in Canada. Existing programs for universal screening for other congenital conditions, as well as Early Hearing Detection and Intervention (EHDI) programs, can be used to support timely evaluation, treatment, and follow-up for cCMV-infected newborns.

Background

cCMV is the most common infection transmitted from mother to baby during pregnancy, with a prevalence rate of approximately 1 in 200 newborns (Cannon, 2010). cCMV is thus the leading non-genetic cause of neurologic disabilities and permanent hearing loss worldwide (Boppana, Ross & Fowler, 2013). This includes hearing loss present at birth, and hearing loss that develops in early childhood (Morton & Nance, 2006). Vestibular disorders are also common in children infected with cCMV (Bernard et al, 2015).

If cCMV is detected within a few days after birth, the newborn's candidacy for antiviral treatment can be assessed promptly. Studies indicate that antiviral treatment improves hearing and developmental outcomes in infants who are born with cCMV (Kimberlin et al, 2015). The oral medication, valganciclovir, is the current standard of care for babies with symptomatic cCMV (Kimberlin et al, 2015; Gantt, 2017). Treatment is safe, effective, and generally well-tolerated.

For newborns with cCMV who are not eligible for antiviral treatment, initiation of hearing assessments at regular intervals can support early hearing loss detection and intervention. This is important because newborns with cCMV may develop hearing loss later in childhood, and hearing can deteriorate over time (Fowler, 2013). With an early cCMV diagnosis, infected infants will also benefit from surveillance protocols that may mitigate other complications, such as neurodevelopmental disorders and vision impairment.

For both cCMV and permanent hearing loss, early identification is critical to mitigating the impact on the child and improving intervention outcomes. Early childhood hearing loss negatively impacts speech, language, and cognitive development if not identified and managed promptly (Tomblin et al, 2015). Timely provision of hearing technology and support for communication during the critical developmental period strengthens positive outcomes (Tobey et al, 2013; Tomblin et al, 2020).

Without universal screening, thousands of Canadian infants with cCMV will go undiagnosed every year. As a result, they may not receive appropriate treatment or support for late-onset hearing loss or other developmental complications of the infection. Since approximately 90% of newborns with cCMV show no symptoms, most will go undetected in the absence of universal screening (Kenneson & Canon, 2007). For infants who display symptoms at birth, cCMV often goes unrecognized because the symptoms may be associated with other conditions (Vaudry et al, 2014; Sorichetti et al, 2016).

In most provinces and territories in Canada, universal newborn screening for cCMV is not available, even in those that have EHDI programs. EHDI programs include universal hearing screening of newborns, surveillance of children at risk of developing hearing loss in early childhood, and intervention services and supports if hearing loss is identified. For parents of a child with cCMV, knowing the cause for hearing loss is important and meaningful. Receiving a timely cCMV diagnosis means fewer unnecessary tests, anticipatory guidance, and comfort in knowing the cause of the hearing loss.

It is recommended that universal cCMV screening be conducted within 21 days of birth. After 3 weeks of age, it is unknown whether the infection was acquired postnatally (e.g., through breastmilk) or congenitally (e.g., in utero). This distinction has implications for antiviral treatment and outcomes (Rawlinson et al, 2017). Screening for cCMV can be done by examining a newborn's saliva, urine, or blood. Although saliva and urine offer the greatest screening sensitivity (Boppana et al, 2011; Ross et al, 2014), routine testing of a blood sample drawn hours after birth is currently available across Canada. The heel prick blood draw is the standard of care in many provinces and territories in Canada to look for treatable diseases that usually show no symptoms at birth. cCMV is not included on the list of diseases screened in the majority of provinces and territories.

Universal newborn cCMV screening would result in long-term cost savings by reducing the burden of hearing loss and lifelong neurodevelopmental disabilities. Research has demonstrated the healthcare costs of one individual with profound hearing loss is approximately $1.2 million USD (Gantt et al, 2016). This includes $280,000 in lifetime costs plus $926,000 in productivity costs. A major contributor to these costs is educational assistance. Estimates of the cost of educational assistance for a child with severe and profound hearing loss with onset before age 6 years ranges from $135,000 - $290,000 (Gantt et al, 2016). Among infants who are positive for cCMV, yet do not show symptoms at birth, it is estimated that there would be a 12% reduction in the costs related to hearing loss due to earlier identification resulting from universal cCMV screening within an EHDI program (Gantt et al, 2016).

Currently, Newborn Screening Ontario (NSO) uses the dried blood spot to screen for cCMV as part of the Hearing Loss Risk Factor Screening in collaboration with Ontario's EHDI Program. Existing program structures for both programs made the addition of universal cCMV screening and follow-up feasible. Children born with cCMV in Ontario who would have otherwise gone undiagnosed are now provided with hearing and developmental monitoring, and antiviral treatment and hearing loss intervention as necessary.

Congenital CMV can cause significant morbidity in newborns, with lifelong implications, yet permanent disabilities are preventable and treatable. If detected early, developmental outcomes of affected children can be dramatically improved with appropriate interventions. Without universal newborn screening for cCMV, most infected infants will go undiagnosed, resulting in failure to provide the necessary early interventions to support positive outcomes. Ontario's successful newborn cCMV screening within its EHDI program provides a precedent for other Canadian provinces and territories.

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