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Case study

Genotyping of cytomegalovirus from toddlers' saliva samples collected with OMNIgene®•ORAL†

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Study overview

Cytomegalovirus (CMV) is a viral genus in the family of herpes viruses. Although they may be found throughout the body, CMV infections are frequently associated with the salivary glands. CMV infection is a life-long condition and is a leading cause of sensorineural loss and central nervous system damage. CMV is also the virus most frequently transmitted to a developing fetus from the mother. CMV seems to have a large impact on immune parameters in later life and may contribute to increased morbidity and eventual mortality.

Dr. Alain and the research team at the Université of Limoges Faculté of Médicine developed a new PCR-RFLP method for rapid screening of human cytomegalovirus (CMV) in large populations. The prevalence of CMV in children is quite high as children are often exposed to CMV through breast-feeding or contact with other infected children in environments such as daycare centers or school. The research team chose to study the CMV virus in children (aged 1–3 years old) to access a diversity of strains in hopes of assisting with vaccine development.

Main challenges

The primary challenge for this study was the age of the study participants (toddlers). A non-invasive method to collect samples of sufficient quality was required to minimize the impact on the young children.

Collection methods considered

Other collection methods previously evaluated for CMV genotyping included twisting diapers to collect urine from the young children.

† Samples for the study were collected with a DNA Genotek kit which the company developed into the commercially available OMNIgene•ORAL OM-501 product.

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Why OMNIgene®•ORAL

Dr. Alain and her team of researchers believed that offering a non-invasive, saliva-based collection device would be the best option for the cohort of very young patients participating in this study. They heard about DNA Genotek through internet research for materials suitable for saliva sampling and DNA detection. OMNIgene•ORAL provides a completely non-invasive and easy-to-use option for collecting microbial DNA while meeting the requirements for both high quality and high quantity DNA.

Results

Over 200 CMV-positive saliva samples were successfully collected from toddlers at 6 day care centers and at the emergency unit of the local hospital with a precursor to OMNIgene•ORAL†. The research team was able to identify 112 strains of CMV that fell into eight groups. As a result, they were able to validate that their new PCR-RFLP method for rapid screening of CMV genotypes can simultaneously determine multiple genotypes of CMV and offer a more precise classification of CMV strains than previous RFLP-based methods.

"The possibility to screen human CMV strains directly from saliva offers both simple non-invasive screening from any population, and identification of field isolates through a major way of transmission to infants or pregnant women."‡

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‡ Grosjean J. et al. Direct genotyping of cytomegalovirus envelope glycoproteins from toddler's saliva samples. J Clin Virol (2009), doi:10.1016/j.jcv.2009.08.018

MK-00050 Issue 2/2015-06