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Letter to Editor

Human Papillomavirus Infection in Newborns: How to Diagnose?

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Received: March 31, 2021; **Published:** April 23, 2021

Abstract

Human papillomaviruses cause a wide range of diseases from benign lesions to invasive tumors. HPV DNA detection in amniotic fluid, foetal membranes, cord blood suggest HPV infection in utero, i.e. prenatal transmission. Ocular surface disease is the possible consequence of foetal exposure to HPV. In this article, we present a newborn with ocular surface disease. The mother had positive HPV test (high-risk HPV types), from the period immediately before conception. In this case, we could not confirm our assumption about prenatal HPV infection as the cause of ocular surface disease in the newborn, due to the limited diagnosis of HPV in the neonatal period. We consider that confirmation of this assumption would significantly contribute to the promotion of the vaccination against HPV. Our message to the authorities in Health Care Services to organize laboratories that will help in the diagnosis of HPV infections in newborns. The message to scientists to develop novel diagnostic approaches in management of ocular surface disease in newborns.

Keywords: *Human Papillomaviruses (HPV); Newborns; Ocular Surface Disease*

Human papillomaviruses (HPV) belong to the virus family of Papovaviridae. The HPVs present epithelial tropism, and cause a wide range of diseases from benign lesions (infections) to invasive tumors [1,2]. HPV infections can be productive, subclinical or latent in both skin and mucosa [2,3]. Mucocutaneous HPVs have been divided into low- and high-risk types [1]. HPV DNA detection in amniotic fluid, foetal membranes, cord blood suggest HPV infection in utero, i.e. prenatal transmission [4].

The recent studies discuss the pathogenetic role of HPV in primary malignancies of the conjunctiva, lacrimal glands, eyelids and orbit [5].

Several studies have investigated HPV as a risk factor for the development of ophthalmic pterygia, but the results are inconclusive. Ocular surface disease is the possible consequence of foetal exposure to HPV. The role of HPV in the pathogenesis has been extensively studied [1,6,7].

Considering the importance of these pathological conditions, the detection of HPV and related biomarkers are very important, a variety of methods are being developed for these purposes [8].

The researchers suggest that PCR-mediated HPV detection in exfoliative swab specimens may be employed as a non-invasive diagnostic tool in the management of pterygia and ocular surface disease [9,10].

Also, exfoliative cytology and impression cytology have been used as a method for evaluating the ocular surface and superficial cells layers in the early diagnosis in adults, with improvement in patient prognosis [11-13].

In this short text, we talk about one clinical problem that we recently encountered in our Tertiary Neonatal Center.

A male newborn was admitted in our Center at 5 day of life because of leucocoria, which was noticed in maternity hospital. Newborn (birth weight 3730g, length 55 cm head circumference 36 cm) is the first child, from the second pregnancy and term Cesarean section, without asphyxia at birth (Apgar score 9/9), regular postnatal adaptation. The first pregnancy ended with an intrauterine fetal death which happened during the last half of pregnancy (the cause was unknown).

An ophthalmic examination was performed upon admission. On the left eye was seen scar (fibrovascular lesion), which destroyed the cornea and iris, and made it is impossible to visualize the posterior segment of the eye. But also on the right eye, he was diagnosed peripheral retinal coloboma (Figure 1).

Figure 1: *The newborn with ocular surface disease.*

Nuclear magnetic resonance imaging of the orbit showed a small difference in the size of the eyeballs. On the damaged left eye, there was destruction of the anterior segment along with the preserved posterior segment (Figure 2).

Figure 2: *Nuclear magnetic resonance (NMR) of the orbit.*

Laboratory findings (Complete blood count, biochemical parameters - glycemia, nitrogenous substances, protein and electrolyte status) at admission were within physiological limits, repeated during hospitalization were also normal.

The newborn was examined during the stay in the department regarding congenital infections (TORCH), associated anomalies (chest X-ray, abdominal ultrasound, cardiac examination). A clinical geneticist's examination was also performed. All findings were in the normal range.

We subsequently obtain information from the mother about a positive HPV test (high-risk mucosal/genital HPV types), from the period immediately before conception.

The current state of the eye in our patient ("ocular surface disease") could be a consequence of congenital HPV infection. A review of the literature confirms that HPV infection play an important role in several aspects of ocular surface disease [1,6,7].

To confirm this assumption, we tried to do a serological test in the newborn (IgM and IgG to HPV). We contacted all major laboratories in our country. They could not help us. The idea of doing PCR for detection HPV from a newborns eye swab also could not be implemented because laboratories in our country could not support it. We also contacted several top laboratories, as well as pharmaceutical faculties in two, neighboring countries. They could not help us and do neither serological tests nor PCR from eye swabs in newborns.

The newborn was transferred to the Eye Clinic, where a corneal transplantation was performed, to enable the proper development of the posterior segment of the damaged, left eye.

In this case, unfortunately, we could not determine the etiology of intrauterine infection and consequent eye damage. We believe that the ocular surface disease in this newborn is a consequence of HPV infection during pregnancy, but we could not prove that.

We also consider that confirmation of this assumption would significantly contribute to the promotion of the vaccination of girls against HPV and maybe permit the use of topical antiviral treatment in HPV related ocular surface diseases.

The message to the authorities in Health Care Services to organize laboratories that will help in the diagnosis of HPV infections in newborns. The message to scientists to develop novel diagnostic approaches in management of ocular surface disease in newborns.

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Volume 10 Issue 5 May 2021