

Clinical Landmarks of COVID-19 in Newborn, Children and Teenagers

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Short Communication

The outbreak of coronavirus infection SARS-CoV-2 was reported in December 2019 in Wuhan, China [1-4]. Globally, the WHO classified the outbreak as a pandemic, which will spread rapidly around the world in March 2020. More than 462,684 cases of COVID-19 infection have been reported by the WHO worldwide, including 20834 deaths (date 26/03/20). 2401 deaths worldwide were registered by the WHO in the last 24 hours (25/3-26/3/2020), indicating the aggressive and devastating potential of the virus. SARS Cov-2 infection leads to loss of life and economic disruption [1,4]. In the "Coronavirus Infection Pneumonia Treatment Plan", the National Health Commission stated that children and infants also suffer from the disease (March 2020) [8]. Initial reports provide information on cases in newborns and children, mostly published by Chinese doctors and researchers [1-7]. Only a few reports describe the first small series of SARS-CoV-2 infections in pregnant women who gave birth to SARS-CoV-2 negative babies [5,6]. By early March 2020, 285 children with SARS-CoV-2 pneumonia and 10 newborns had been diagnosed in China [5,6]. Epidemiological studies

suggest that people are generally susceptible to SARS-CoV-2 and some children have a clear family history [2,3]. The symptoms of some children and newborns are varying and manifest in a few cases as vomiting and diarrhoea and other gastrointestinal symptoms, or only as mental retardation and shortness of breath [8,9]. Children with mild symptoms showed only low fever, mild fatigue and often no pneumatic signs [8,9]. Moreover, children with high fever are known. In a correspondence letter to „The New England Journal of Medicine“ published online on April 2020 by, 171 children were ruled out [13]. They had a median range of 6.7 years with a male preponderance of 60.8 per cent. 64.9 per cent had pneumonia, 19.3 per cent upper respiratory tract infection and 15.8 per cent an asymptomatic infection. Age distribution showed 24.6 per cent 11-15y, 33.9 per cent 6-10 y, 23.4 percent 1-5 y and 18.1 per cent younger than 1 year old child. A family cluster infection was found in 90.1 per cent (139). The symptoms found were cough in 48.5 per cent, fever in 41.5 per cent, pharyngeal erythema in 46.2 per cent. Diarrhea was present in 8.8. per cent, fatigue in 7.6 per cent, vomiting in 6.4 per cent. Tachypnoea was present in 28.7 per cent, tachycardia in 23 percent [13]. CT revealed ground-glass opacity in 32.7 percent of

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children, local patchy shadowing in 18.7 percent of cases, bilateral patchy shadowing in 12.3 percent. Interstitial abnormalities were found in 2 patients (1.2 per cent) [13]. In an observational study from China, 36 children were found to have higher levels of procalcitonin, D-dimer and creatine kinase isoenzyme MB, suggesting a myocardial role in COVID-19 disease in children [7]. In children and neonates, a possible explanation for the mild clinical course of COVID-19 could be immature angiotensin II receptors, the primary docking site of the spike protein of the SARS CoV-19 virus [10]. More than 80% of angiotensin II receptors in children belong to the AT2 subtype, with less severe cases being assumed in children [12]. The hypothesis could be that more AT1 receptor binding of COVID-19 is found as in adults, the more severe case. More than 80% of pulmonary ACE2 receptors are positioned on type II alveolar epithelial cells that produce pulmonary surfactant. A lack of surfactant due to impaired surfactant synthesis in type II cells should be further analyzed. Until the end of March 2020, three months after the onset of the disease, clinical studies led to the conclusion that the clinical course of newborns, children and adolescents follows the algorithm "the older the more severe" [6,7,8,9]. Children can play an important role as asymptomatic transmitter of COVID-19.

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