Pediatric Investigation Research Letter Inspects Parvovirus B19-Induced Myocarditis Cases in Preschoolers

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BEIJING, HEBEI PROVINCE, CHINA, January 15, 2025 /EINPresswire.com/ -- Inflammation of the heart muscle, also known as myocarditis, can be caused by various viral infections. Parvovirus B19, known for inducing rashes in children and infants, has recently drawn attention as a potential risk factor for myocarditis in infants. In this research letter, researchers study and report cases of myocarditis in preschool students caused by parvovirus B19 infections. The letter aims to shed light on the detrimental effect of the disease to increase awareness.

Myocarditis is a rare yet serious condition known for the inflammation of the heart muscle, also known as the myocardium. In severe cases of myocarditis, the heart muscle becomes extremely weak and fails to pump blood effectively. This, in turn, can lead to heart failure and death. A thorough and timely intervention is important for ensuring the effective treatment of myocarditis.

Parvovirus B19, a single-stranded DNA virus spread by respiratory droplets, is known for infecting infants. It is associated with mild flu-like symptoms, including fever, joint pain, and the red rash on the cheek, called the ‘slapped cheek’ rash or erythema infectiosum. Recent reports have linked parvovirus B19 to cases of myocarditis in children. However, owing to their mild nature, the symptoms of parvovirus B19 are often ignored. Nonetheless, the symptoms of myocarditis require proper diagnosis and treatment, making it essential to study the cases of

myocarditis associated with parvovirus B19 and understand its impact on infected children.

To this end, a group of researchers, led by Dr. Filippos-Paschalis Rorris from the Onassis Cardiac Surgery Center, Athens, Greece, decided to report some cases of myocarditis caused by a regional outbreak of parvovirus B19 in preschoolers. “While the majority of myocarditis-causing viruses impact cells in the heart muscle, parvovirus B19 works differently. The endothelial cells, forming the inner lining of the coronary arteries, are targeted by this virus. This causes a decrease in cardiac blood flow and leads to myocardial dysfunction. It is crucial to investigate myocarditis cases caused by the virus,” explained Dr. Rorris. The research letter was published in Pediatric Investigation on January 03, 2025, and is based on five reports of parvovirus B19 myocarditis in preschoolers from the Thessaloniki region in northern Greece.

The researchers used polymerase chain reaction (PCR) to confirm the presence of parvovirus B19 in the children, while echocardiography, followed by cardiac magnetic resonance (CMR) imaging, confirmed myocarditis in them. All of them reported left ventricular failure, which restricted blood flow in the lower-left chamber of the heart, and were thus admitted to the pediatric intensive care unit.

Among the admitted children, one experienced cardiac arrest and did not survive. The ejection fraction of this patient was extremely low, indicating that the heart failed to pump enough blood with each beat. Laboratory values and diagnostic details of the other four patients were collected over the next few days. The patients were also provided with inotropic support, known to change the force of the heart’s contraction, along with heart failure medications whenever required and immunoglobulin therapy.

All four surviving patients reported abnormal levels of N-terminal pro-B-type natriuretic peptide (NT-proBNP), Troponin I (TnI), and left ventricular ejection fraction (LVEF). Elevated NT-proBNP levels indicate that the heart is working harder to pump blood. Elevation in TnI levels occurs due to infections, injuries, and conditions that affect the heart. LVEF is used to measure how well the heart pumps oxygen-rich blood to the body. Of the surviving four patients, one patient with an LVEF of 15% did not show any signs of improvement and was referred for a cardiac transplant.

These findings can improve the future management of parvovirus B19 myocarditis in children and infants. As Dr. Rorris mentions, “Cardiac biopsy, where a small amount of heart muscle is retrieved, is considered to be the gold standard for diagnosis. However, it can become invasive for children. Hence, we wanted our diagnosis confirmation to be based on CMR, a non-invasive procedure, and PCR assay was done to confirm the presence of parvovirus in blood.” Adding further, Dr. Maria Kontou, another researcher associated with the study, says, “We were also intrigued by the sudden escalation of the disease caused by the virus in one particular area. This can be due to a higher level of virulence of parvovirus.”

With parvovirus B19 myocarditis in children being associated with mortality and morbidity, quick diagnosis and treatment by specialists are required. Further research based on virus-specific

therapies along with myocarditis-specific treatment can reduce the risk among children in the future.

Reference
Titles of original papers: Regional outbreak of parvovirus B19 acute myocarditis in preschool children
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About Dr. Filippos-Paschalis Rorris
Dr. Filippos-Paschalis Rorris is a Surgeon at the Paediatric and Adult Congenital Cardiac Surgery Department of the Onassis Cardiac Surgery Center in Greece. After graduating from the Faculty of Medicine at Masaryk University, Brno in the Czech Republic in 2016, Dr. Rorris served in the army as a medical doctor on Chios Island. He subsequently completed his residency in General Surgery at the Evangelismos General Hospital in Athens and joined the Onassis Cardiac Surgery Center in 2023. He has 30 publications till date with over 70 citations, with a h-index of five. He is associated with organizations like the Cardiothoracic Surgery Network and the European Society of Thoracic Surgeons.

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