

Case report

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NE-Coli sepsis or SARC-COV-2?! A neonatal case report; Can SARS-COV-2 transfer by care provider hands?

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Abstract

Introduction: Since December 2019, an outbreak of a novel virus was happened in Wuhan, China and globally spreading virus that is called SARS-COV-2. There is little information about clinical features and epidemiological data of the virus specially in children and neonates. The disease that happens after infection is so mysterious and with unspecified sign and symptoms. Course of infection in adult and children are more recognized despite of neonate's course. Route of transmission between neonates are not identified clearly, so maybe many cases or serially reporting, solve the problem.

Case Presentation: We introduce an Iranian male newborn who admitted to neonatal intensive care unit (NICU) in a private hospital of Alborze province, Iran, with grunting and poor feeding. His mother had negative nasopharyngeal (NP)- covid-19's PCR. He had fever for about 6 days, grunting and respiratory distress that was intubated for some days. He was positive for covid-19. Due to continuous fever, in his second sepsis work up he had positive blood culture with *Escherichia Coli* (*E. coli*) finally, he was treated with intravenous immunoglobulin (IVIG) and hydrocortisone.

Conclusion: According to co-hospitalization of a covid-19 positive neonate in this NICU, although there was 3 meter distances between he and our case, it is possible that covid-19 infection was spread by nursing care, therefore it was the main cause of ECOLI infections as mentioned in previous studies.

Keywords: SARS-Cov2, Coronavirus, covid-19, neonates, caregiver hands, contagious Infectious

Introduction

On December 2019 the first cases of pneumonia were detected in Wuhan, China caused with SARS-COV-2 which spread rapidly in china and through all over the world [1]. The world health organization declared COVID-19 a pandemic disease by October 2020 [2]. It is mainly by respiratory droplets [3]. Elderly is the most high-risk population for covid-19 and people with sever co-morbidities [4]. As well, this new virus could contagion pregnant woman and their neonates too and will cause sever mortality for them [5]. It has been confirmed that this novel coronavirus has vertical transmission too [6]. children, especially neonates may have no specific symptoms and findings, but has been seen to have fever, respiratory distress, lethargy, cough, abdominal pain and distention, tachypnea, tachycardia and gastrointestinal manifestations [7- 10].

Here we describe a neonate with a negative PCR of covid-19 for mother that was positive of SARS-COV-2 in pregnancy. Since he was intubated and had longtime fever, he was defined as a sever case of covid-19 disease.

Patient Information

A preterm (gestational age=36 w+6 days) infant, Male, from Iran was born on October 26, 2020, in a private hospital of Alorze province, Iran. His APGAR score was 9/10 in 1 and 10/10 in 5th minute of birth. umbilical cord was turned around his neck twice. His birth wight was 2970 grams and was delivered by cesarean section. Mother had gestational diabetes melitus, controlled by Metformin, without any other risk factors.

Because of premature rupture of membrane (PROM<18 hours), pregnancy was ended and since the neonate was good, he had skin to skin contact with her mother. In past medical history, there was another dead neonate with the diagnosis of pulmonary hypoplasia. Her husband was Dutch and they had two other neonates which were died without any specific etiology. Two weeks before delivery mother had signs and symptoms of flue, but NP-RT-PCR was negative for SARS-CoV 2

Clinical Findings

Two hours later after the birth he found grunting and poor feeding, so he was admitted to the NICU immediately. Oxygen therapy was started rapidly, since the continuing of grunting, we initiated continuous positive airway pressure (CPAP) therapy. Ampicillin and amikacin started. His chest-x-ray had reticulonodular pattern. Subsequently, he was intubated due to progressive severe respiratory distress, so he received surfactant through endotracheal tube. The day after admission, he had axillary temperature of 38-39 frequently.

Diagnostic Assessment and Therapeutic Interventions

Because of the 3 meters distance from another covid-19 positive neonate and his fever, NP-PCR of COVID-19 was sent (in the second day of birth). Ammoniac and lactate were done due to his sibling's death which were normal. His temperature was high in 5th days. In the second day, his antibiotic therapy was promoted to Meropenem and Vancomycin. His lumbar puncture analysis was normal. The result of PCR was positive (in his third day of life). By passing 4 days of birth, he had fever and so we

performed sepsis work up and stated using IVIG (1 gr/kg daily for two days) and hydrocortisone (5 mg/kg loading dose and 1 mg/kg/BID for 5 days).

He was extubated in 5th day of birth and nasal CPAP started for him. His first blood culture was negative and the second one because of the long-term fever was sent again. Total parenteral nutrition was started for him in 6th day of life and oxygen therapy with oxyhood started for him. His second blood culture was positive by Ecoli, so cefotaxime was added to his antibiotic regimen, after that the third blood culture was sent (that bacteria was sensitive to cefotaxime and imipenem). To rule out meningitis disease, we tested his CSF fluid again while the positive B/C but it was normal. The result of third blood culture, urine cultures and CSF cultures were negative too. in Echocardiography small PDA was reported and recommendations was fluid limitation. Brain and abdomin-pelvic sonography were normal. He had SARS-COV-2 positive NP-PCR, and, positive blood culture, E.coli.

we decided to treat him for 14 days after the positive B/C with the antibiotic regimen of meropenem, vancomycin and cefotaxime. Unfortunately, his family discharged him in the 12th day of treatment with personal satisfaction.

Follow up and out comes

after following him, he was good and did not have any problem after two weeks.

Timeline

Table 1: First laboratory tests

Laboratory test	result	Normal range
WBC	15100	4200-10000
Lymph	40	21-53
Neutrophil	51	34-68
Hemoglobin	14/4	13/7-17/5
Platelet	232	150000-450000
Lactate Dehydrogenase	1420→1700	207-414
CRP	<2→32	<10
PH	7/36	7/35-7/45
PCO2	37	35-45
HCO3	21/3	18-26
Ca	6/8	9-11
Blood culture	negative	
Covid-19 PCR	positive	
CSF culture	negative	

Table 2: Second lab tests

Laboratory test	result	Normal range
WBC	17000	4200-10000
Lymph	60	21-53
Neutrophil	23	34-68
Hemoglobin	11/2	13/7-17/5
Platelet	490000	150000-450000
Lactate Dehydrogenase	1420→1700	207-414
CRP	3	<10
PH	7/43	7/35-7/45
PCO2	45	35-45
HCO3	30/1	18-26
Ca	9/6	9-11
Blood culture	Ecoli: despite treatment by meropenem	

Discussion

The SARS-COV-2 caused by the novel coronavirus 2019 disease, is a new global pandemic. It is one of the most health emergency in the last hundred years. Although it is passed about one year of the occurrence of covid-19, it has not eradicated or fully controlled until yet, and uncertainty about this pandemic and all of its aspects specially in neonates still is prominent. Prior epidemiological and clinical characteristic studies have shown that children are susceptible to SARS-COV-2 [11-13]. Previous reports showed that vertical transmission of SARS-COV-2 could happen and would have its side effects on neonates too [6]. Here we described a neonate with longtime fever and respiratory distress. His mother had negative NP- PCR for SARS-CoV2. There are lots of studies that shows lactate dehydrogenase increasing is a laboratory index for evaluating the severity of the disease in covid-19 patients [14]. Despite the fact that has shown no specific lab data are available for the covid-19 diseases in neonates, our newborn had two increasing serum LDH which was increased in the second test too, 1420 was the first LDH level and the second one was 1700 [15]. APGAR score, neurological examination, and blood gas was normal which asphyxia was excluded. In this report, our case had hypocalcemia in the second day, and because of we had another case report which their neonate either had hypocalcemia, so we should consider hypocalcemia as one of the first lab data in some neonates with covid-19 diseases [16]. Due to the lack of reliable data of early onset-infection of covid-19 diseases in neonates, it could be concerned that the manifestations of our case were because of sepsis or pneumonia, rather than SARS-COV-2. According to the latest articles neonates that requiring NICU admission, should be admitted in an isolated single negative pressure room [17]. Our neonate was admitted to NICU without isolation and had a 3 meters distance with the other neonate, who had positive NP-PCR test for SARS-COV-2. The two neonates had only one care provider. Due to the suggested distance (more than 6 feet) by WHO and the observation for our neonate, there is a theory that the same nursing care could cause covid-9 diseases in our neonate, on the other hand the other theory is the early-onset sepsis of covid-19 disease for him that were transmitted from mother to fetus. In our case horizontal transmission can not be rule out too.

Conclusion

Based on our information, only a few early-onset sepsis of covid-19 has been reported worldwide. Neonatal diseases of SARS-COV-2 have a variety of manifestation ranges, despite most of the children have been mildly got involved.

We suggest the early isolation of neonates who are delivered from the confirmed or suspected mother of SARS-COV-2 and the separate nursing care and specified person that her or his task is taking care of COVID-19 positive neonates and he or she shouldn't have another patient.

We need further investigations for detecting the specific lab data, diagnostic tests and treatment for SARS-COV-2 diseases.

Abbreviations

NICU: neonatal intensive care unit
 NP: nasopharyngeal
 ECOLI: Escherichia Coli
 IVIG: intravenous immunoglobulin
 CPAP: continuous positive airway pressure

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