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<https://doi.org/10.1016/j.anpede.2020.12.005>

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Horizontal SARS-COV-2 infection in three newborns: We can also avoid unnecessary irradiation[☆]



Infección horizontal por SARS-COV-2 en tres recién nacidos: también podemos evitar irradiación innecesaria

Dear Editor:

Since December 2019, a novel coronavirus since named SARS-CoV-2, the causative agent of coronavirus disease 2019 (COVID-19) has given rise to a global pandemic.

In June 16, 2020, the World Health Organization reported that there had been 8 035 583 cases and 436 918 deaths worldwide.¹ In children, most cases manifest with mild upper respiratory symptoms or are asymptomatic.² At the moment, the evidence on the presentation and outcomes of cases in neonates is scarce.³

We present the cases of 3 neonates infected by SARS-CoV-2 managed in the department of paediatrics of our hospital. Table 1 summarises the clinical and laboratory characteristics of the cases.

Patient 1 was a neonate aged 4 days brought to the emergency department due to weight loss associated with maternal hypogalactia. The infant had no fever or rhinorrhoea. Per hospital protocol, the mother had undergone a polymerase chain reaction (PCR) test for detection of SARS-CoV-2 before delivery, which turned out negative. The examination in the emergency department revealed a weight loss of 15% of the birth weight and moderate dehydration that prompted initiation of intravenous fluid therapy. There were no abnormal findings in the physical examination. The vital signs were as follows: heart rate, 148 beats

per minute; respiratory rate, 40 breaths per minute; oxygen saturation (pulse oximetry) 98%; axillary temperature, 36.6 °C. Since the patient had to remain in the observation unit of the department, a nasopharyngeal aspirate sample was obtained to perform a SARS-CoV-2 PCR test, which was positive; there were no other abnormal findings of laboratory tests. The patient improved while under observation and was discharged from the emergency department after 12 h. The patient was followed up for one month post discharge through telephone calls, which confirmed the absence of symptoms and adequate weight gain.

Patient 2 was a neonate aged 25 days referred due to fever (maximum axillary temperature, 38 °C) of 16 h' duration with no other symptoms. Positive history of exposure in the home environment to a parent with cold symptoms and fever. The physical examination was normal. The vital signs in the emergency department were: heart rate, 136 beats per minute; respiratory rate, 38 breaths per minute; oxygen saturation, 99%; rectal temperature, 37.1 °C. Tests for viral detection were performed in nasopharyngeal aspirate samples, and were negative for influenza and respiratory syncytial virus, and positive for SARS-CoV-2. The results of blood tests were normal. The patient was discharged home after 8 h under observation due to his excellent general health and afebrile status. Telephone calls made to follow-up in subsequent weeks ascertained that the patient had a favourable outcome.

Patient 3 as a neonate aged 28 days brought in with fever (maximum temperature of 38.6 °C) lasting 24 h. The patient had no cough, rhinorrhoea or any other associated symptoms. There was no evidence of exposure to infectious disease in the environment. The physical examination in the emergency department was normal, with a heart rate of 136 beats per minute, a respiratory rate of 30 breaths per minute, an oxygen saturation of 99% and a rectal temperature of 37.2 °C. The results of blood tests were normal. Viral detection tests in nasopharyngeal aspirate samples were negative for influenza and respiratory syncytial virus, but positive for SARS-CoV-2. The patient remained in the obser-

[☆] Please cite this article as: Rodríguez-Fanjul J, Nicolas M, Coroleu W, Méndez M, Liria CRG. Infección horizontal por SARS-COV-2 en tres recién nacidos: también podemos evitar irradiación innecesaria. *An Pediatr (Barc)*. 2022;96:151–153.

Table 1 Clinical and laboratory characteristics of the cases.

Patient	GA	BW	Type of delivery	Breastfeeding	URTl	Tachypnoea	Vomiting or diarrhoea	Cutaneous lesions	Leucocytes ($\times 10^3/\text{mm}^3$)	Lymphocytes ($\times 10^3/\text{mm}^3$)	CRP (mg/L)	Platelets ($\times 10^3/\text{mm}^3$)
1	39 ⁺¹	2900	Caesarean	Yes	No	No	No	No	7400	3800	18.5	243
2	40 ⁺⁵	3420	Uncomplicated vaginal	Yes	No	No	No	No	6900	3250	1.3	195
3	38 ⁺¹	3140	Uncomplicated vaginal	Yes	No	No	No	No	6700	3800	6.5	316

vation unit for 12 h, during which he remained afebrile and in excellent general health, so he was discharged home. The follow-up telephone calls made in the month following discharge evinced that everything remained normal.

Few data have been published on the clinical presentation of SARS-CoV-2 infection in neonates or young infants. None of the patients in our series exhibited respiratory symptoms during the course of disease: one was asymptomatic at all times and the other 2 had fever as the sole symptom. Due to the absence of respiratory symptoms, imaging tests were not deemed necessary, as established in the protocol for management of viral infections to avoid unnecessary exposure to radiation. In China, in the early days of the pandemic, computed tomography scans and chest radiographs were frequently done in infected children but did not yield useful information in asymptomatic patients.⁴ Adding to the clinical experience acquired throughout the pandemic, these cases support adhering to the general approach of avoiding unnecessary irradiation in infants without clinical features suggestive of lower respiratory tract involvement in cases of paediatric infection by SARS-CoV-2.

The most recent guidelines of the Asociación Española de Pediatría (Spanish Association of Pediatrics) call for restricting plain chest radiography to patients with respiratory manifestations requiring hospital admission.⁵ Our findings corroborate that in the absence of signs or symptoms suggestive of pneumonia, the clinical condition of infants is good and fever is self-limiting, so it is better to avoid the exposure to radiation involved in a test that is unlikely to yield any benefits.⁶

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<https://doi.org/10.1016/j.anpede.2020.10.014>
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A neonatal hypocalcemia due to maternal vitamin D deficiency. Reviewing supplementation[☆]



Hipocalcemia neonatal precoz por déficit de vitamina D materna. Replanteando la suplementación

Dear Editor:

Neonatal hypocalcaemia is a common and potentially severe metabolic disorder of variable aetiology. Vitamin D deficiency (VDD) has been described as a cause of neonatal late-onset hypocalcaemia (NLOH). We describe our experience with 2 cases of neonatal early-onset hypocalcaemia (NEOH) associated with neonatal and maternal VDD.

Case 1: newborn girl that developed pathologic tremors at 40 h post birth. The mother was of European ascent exposed to sunlight less than 30 min a day. The patient was born in March at 38 weeks of gestation with a birth weight 3590 g in an uncomplicated vaginal delivery. Testing found serum levels of ionized calcium of 4.2 mg/dL, total calcium of 8.1 mg/dL and vitamin D of 14 ng/mL. The infant was given calcium gluconate 10% orally at a dose of 2 mL/kg/day, which improved the clinical manifestations. Testing in the mother found levels of vitamin D of 13 ng/mL and of parathyroid hormone (PTH) of 82.8 pg/mL (15–65 pg/mL).

Case 2: newborn boy that exhibited hypotonia and lethargy at 48 h post birth. The mother was of Arabic ancestry with no exposure to sunlight. The boy was born in February in an uncomplicated delivery at 40 weeks of gestation, with a birth weight of 3180 g. He had serum levels of ionized calcium of 3.27 mg/dL, total calcium of 8.2 mg/dL and vitamin D of 7.1 ng/mL. Calcium gluconate 10% was administered to the patient by the oral route at a dose of 2 mL/kg/day, which improved the clinical manifestations. The mother had serum levels of vitamin D of 4.2 ng/mL, of PTH of 57.9 pg/mL, of total calcium of 8 mg/dL and of phosphorus of 2.5 mg/dL.

Both mothers resided in Teruel (latitude, 40.25°) and had a skin phototype of 1–2 in the Fitzpatrick scale, a low level of physical activity (took some walks each week) and a body mass index under 30 kg/m², and neither was taking vitamin D. Both mothers were treated successfully with calcifediol supplementation.

Tremors are the most frequent paroxysmal manifestations in the neonatal period, and hypotonia and lethargy

are nonspecific symptoms found in neonatal metabolic disorders. They must be assessed as early warning signs of disorders like hypocalcaemia and VDD.¹

The main symptoms of neonatal hypocalcaemia are agitation, tremors, lethargy, seizures, changes in muscle tone, stridor or prolongation of the QTc interval (>0.4 ms). A distinction is made between NEOH (the first 3–4 days of life) and NLOH (the next 5–10 days) (Table 1). Historically, vitamin D deficiency has not been considered a cause of NEOH. The evidence shows a probable association between ethnicity, maternal vitamin D levels and neonatal serum calcium levels,² so that maternal vitamin D levels and neonatal calcium levels may vary depending on the maternal phototype or cultural factors, and previous data suggest that higher supplementation doses may have a positive impact on the infant, including on calcium levels (Table 2).³

In Spain, one study found that even with multivitamin supplementation including 200 IU/day of vitamin D, 63% of pregnant women have insufficient vitamin D levels and 26% deficient levels.⁴ Another study found levels under 20 ng/mL in 64.4% of mothers and 41.3% of neonates and identified multiple gestation and non-European ethnicity as risk factors for hypovitaminosis D, and maternal supplementation, physical activity and sunlight exposure as protective factors.⁵ Although VDD is very prevalent and underdiagnosed, the authors of systematic reviews with meta-analysis have been

Table 1 Causes of neonatal hypocalcaemia.^a

Neonatal early-onset hypocalcaemia	Neonatal late-onset hypocalcaemia
Preterm birth	Vitamin D deficiency ^b
Intrauterine growth restriction	Hypoparathyroidism
Hypomagnesaemia	Maternal hyperparathyroidism
Hyperbilirubinaemia	Calcium malabsorption
Toxaemia	Diuretic drugs
Perinatal asphyxia	Alkalosis
Maternal type 1 diabetes	Hypomagnesaemia
Maternal hyperparathyroidism	Hyperphosphataemia
Anticonvulsant drugs	Citrate in transfusions (chelating agent)
	Phototherapy

^a Neonatal hypocalcaemia: serum total calcium <8 mg/dL (2 mmol/L) or ionized calcium <4.4 mg/dL (1.1 mmol/L), in term neonates and preterm neonates with birth weights greater than 1500 g, and total calcium <7 mg/dL (1.75 mmol/L) or ionised calcium <4 mg/dL (1 mmol/L) in very low birth weight neonates or neonates weighing <1500 g.

^b Vitamin D level: normal (>30 ng/mL), insufficient (15–30 ng/mL) deficient (<15 ng/mL).

[☆] Please cite this article as: Adán Lanceta V, Martín Ruiz N, Benito Costey S, Aljarde Lorente R, Martínez de Zabarte Fernández JM. Hipocalcemia neonatal precoz por déficit de vitamina D materna. Replanteando la suplementación. An Pediatr (Barc). 2022;96:153–154.