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Un Nuevo Concepto en Medicina Perinatal

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REVIEW ARTICLES

Coronavirus Disease 2019 in Pregnancy and Outcomes Among Pregnant Women and Neonates

A Literature Review

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- Revisión de los articulos publicados sobre mujeres con Dg confirmado (PCR o IgM) de COVID-19, publicados entre el 01 de Enero del 2020 hasta el 15 de Agosto 2020
  - 196 estudios (55 USA / 44 China)
  - 1922 mujeres COVID-19 (+)
  - 1361 neonatos expuestos

- Análisis descriptivo de las características clínicas y demográficas de las mujeres embarazadas y los neonatos hijos de madres positivas

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TABLE 1. Outcomes Among Pregnant Women With Laboratory-confirmed SARS-CoV-2 Infection

Maternal Characteristic	Total, n = 1922
Trimester (n = 1539), n (%)	
First trimester	36 (2)
Second trimester	140 (9)
Third trimester	1363 (89)
Hospital course, n (%)	
ICU admission	181 (11)
Mechanical ventilation	123 (8)
Death	22 (1)
Pregnancy outcome (n = 1825), n (%)	
Delivered, live birth	1359 (74)
Delivered, stillbirth	19 (1)
Delivered, neonatal outcome not reported	74 (4)
Induced abortion	8 (0)
Spontaneous abortion	12 (1)
Ectopic pregnancy	1 (0)
Remained pregnant	352 (19)

Maternal and pregnancy outcomes among women with laboratory-confirmed SARS-CoV-2 infection. Pregnant women described as mild or asymptomatic were presumed to not have been admitted to an ICU or have required mechanical ventilation, even if not explicitly stated. Cases reported as critical were presumed to require ICU admission, even if not explicitly stated. ICU admission was not presumed for cases described as severe. N reported for individual pregnancy outcomes reflects number of pregnant women with each outcome, not number of fetuses or neonates; multiple gestation is not reflected. Live birth does not preclude later neonatal death; refer to Table (Supplemental Digital Content 2, http://links.lww.com/INF/E324) and Table (Supplemental Digital Content 3, http://links.lww.com/INF/E325) for neonatal outcomes. Percentages reported for each trimester reflect proportion of women for whom trimester could be assigned. Percentages reported for maternal ICU admission, mechanical ventilation, and death were calculating using denominator of women for whom outcomes were known (n = 1613, n = 1547, and n = 1718, respectively).

- La prevalencia de positividad de mujeres embarazadas es difícil de estimar y varía según el lugar de procedencia y el momento epidemiológico
  - NY Marzo 2020 con screening universal: 15,4% a 19,9%
  - Abril 2020: LA 0,0% v/s Connecticut 3,9%

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- 22 muertes maternas
- Comorbilidad heterogénea
  - HTA, asma, DM
  - Sin diferencia significativa respecto de HTA o DG
- Asociación entre obesidad materna e infección por COVID-19
- 57% de los partos fueron por cesárea
  - 12% cesárea por COVID-19
  - 6% disminución de los movimientos fetales o desaceleraciones
- 28% prematuros

TABLE 3. Clinical and Demographic Characteristics of Neonates Born to Mothers With SARS-CoV-2 Infection

Clinical and Demographic Characteristic	Neonates With Positive SARS-CoV-2 PCR Testing, n = 61	Neonates Without Positive SARS-CoV-2 Testing, n = 1269	All Neonates, n = 1330
Maternal critical illness, n/total (%)	10/31 (32)	101/802 (13)	121/973 (12)
Gestational age in completed weeks, median (IQR)	35 (31–38); n = 38	38 (36–39); n = 554	38 (36–39); n = 592
Preterm, n/total (%)	22/40 (55)	281/1056 (27)	339/1273 (27)
Birth weight, g, median (IQR)	2520 (1808–3184); n = 34	3110 (2675–3400); n = 431	3110 (2600–3380); n = 465
Male sex, n/total (%)	21/35 (60)	226/398 (57)	250/439 (57)
Caesarean delivery, n/total (%)	31/45 (69)	671/1164 (58)	714/1230 (58)
APGAR score at 1 min, median (IQR)	8 (5–9); n = 25	8 (8–9); n = 365	8 (8–9); n = 435
APGAR score at 5 min, median (IQR)	9 (8–9); n = 26	9 (9–10); n = 408	9 (9–10); n = 479
Neonatal asphyxia, n (%)	2/46 (4)	15/1023 (1)	17/1070 (2)
Separation from mother after delivery, n/total (%)	34/40 (85)	375/559 (67)	415/611 (68)
Breast-fed, n/total (%)	4/31 (13)	184/575 (32)	199/627 (32)
NICU admission, n/total (%)	39/43 (91)	296/932 (32)	343/997 (34)
Fever, n/total (%)	9/32 (28)	8/511 (2)	18/554 (32)
Respiratory distress, n/total (%)	35/51 (69)	91/535 (17)	126/590 (21)
Abnormal chest imaging, n (%)	21/26 (81)	22/39 (56)	43/65 (66)
Need for PPV, n/total (%)	11/38 (29)	34/837 (4)	45/885 (5)
Need for mechanical ventilation, n/total (%)	14/50 (28)	30/864 (3)	44/918 (5)
GI symptoms, n/total (%)	8/29 (28)	16/481 (3)	25/527 (5)
DIC, n/total (%)	1/44 (2)	3/836 (0)	4/888 (0)
Lymphopenia, n/total (%)	4/17 (24)	8/190 (4)	12/207 (6)
Thrombocytopenia, n/total (%)	5/17 (29)	16/170 (9)	21/187 (11)
Elevated aminotransferases, n/total (%)	8/16 (50)	84/160 (53)	92/176 (52)
Neonatal death, n (%)	1/55 (2)	13/1131 (1)	14/1167 (1)

APGAR indicates Appearance, Pulse, Grimace, Activity, and Respiration score; DIC, disseminated intravascular coagulation; GI, gastrointestinal; IQR, interquartile range; PPV, positive pressure ventilation.

Clinical and demographic characteristics of neonatal with perinatal COVID exposure. Studies not reporting neonatal outcomes were excluded. Neonates without positive SARS-CoV-2 PCR testing include neonates with negative testing and neonates in whom testing was not performed or reported. Not all variables of interest were reported for all neonates; denominators reported for individual variables as appropriate. Breast-feeding was defined as direct breast-feeding; use of expressed breast milk only was not considered breast-feeding. Neonates described as asymptomatic were presumed to not have clinical symptoms (fever, respiratory distress, GI symptoms, asphyxia) or have required PPV or mechanical ventilation. PPV includes noninvasive modalities including continuous positive airway pressure, synchronized intermittent positive airway pressure, and noninvasive PPV. GI symptoms include abdominal distention, feeding intolerance, vomiting, and diarrhea. Lymphopenia was defined as a lymphocyte count < 1500/mm^3. Thrombocytopenia was defined as a platelet count < 150,000/mm^3. Aminotransferases were considered elevated if either aspartate aminotransferase or alanine aminotransferase was > 40 U/L.

TABLE 2. SARS-CoV-2 PCR Test Results Among Neonates With Perinatal COVID-19 Exposure

Sample Type	Total, n = 1361, n Positive/Total Samples (%)
Neonatal samples	
NP/OP swab	42/820 (5)
Sputum	0/2
Gastric aspirate	0/15
Anal/rectal swab	7/68 (10)
Stool	3/22 (14)
Urine	0/20
Blood	4/19 (21)
CSF	0/3
Unspecified	17/400 (4)
No reported testing	139 (10)
Neonates with at least 1 positive SARS-CoV-2 sample	61/1361 (4); 61/1222 with reported testing (5)
Maternal/delivery samples	
Cord blood	1/34 (3)
Amniotic fluid	2/40 (2)
Placenta	4/35 (11)
Vaginal	2/11 (18)
Cervical	0/1
Anal/rectal swab	1/4 (25)
Stool	1/4 (25)
Urine	0/4
Blood	2/8 (25)
Breast milk	3/45 (7)

CSF indicates cerebrospinal fluid; OP, oropharyngeal.

SARS-CoV-2 PCR test results by sample type. Multiple samples of the same sample type/location collected from a neonate at multiple time intervals are only counted once. For detailed test results by study, please see Table (Supplemental Digital Content 2, http://links.lww.com/INF/E324).

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Empowering mothers to realize their choice for infant feeding

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Milk, as the nutrient-rich liquid produced in the mammary glands, is critical to early survival of mammals. Many mammals do not survive without colostrum which is the early milk that is dense in immune factors specifically formulated for an immature gut. Yet, humans do survive without colostrum and survive without any human milk especially when replaced by manufactured infant formulas. In fact, many formula-fed humans live without significant sequelae to their individual health and development. Therefore, towards the end of the 21st century, formula feeding had become the primary feeding method in numerous high- and middle-income countries. Yet, over the past two decades, human milk feeding has experienced a resurgence. Why has this occurred?

Study of human milk composition has led not only to greater knowledge but to critical new research frontiers into the intricacy of milk components. Milk components commonly demonstrate multiple roles not only in nutrient delivery but also in immune protection and in organ development. Cytokines, immunoglobulins, probiotics, enzymes, white excellent opportunity for interventions to improve metabolic health.

Concurrent with progress in the field of human milk science is expansion of education regarding the benefits of human milk to populations throughout the world. The World Health Organization's Baby Friendly Hospital Initiative has led to a universal expectation that families will be informed of the benefits of mother's milk and taught the art of milk expression. A mother should not feel forced to breastfeed, but instead she should be empowered to make her educated choice for herself and her infant. Bolstered with knowledge, more mothers, including mothers from populations with historically low breastfeeding rates, are providing mother's milk. This progress is exciting but also distressing that this galvanizing information was not offered to all women for so many years. This current increase in mothers choosing to breastfeed now intensifies the need to ensure every mother has the necessary tools to achieve her lactation goals.

Empowered with information as to the importance of

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Immunologic components in human milk and allergic diseases with focus on food allergy

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ABSTRACT

Human milk contains a wide range of immunomodulatory factors, including immunoglobulins, human milk oligosaccharides, cytokines, microbiome, innate factors and food antigens. Maternal diet can influence the content of human milk as it is well-established that dietary antigens can be secreted in human milk after maternal consumption, but whether these dietary antigens promote tolerance or sensitization in the infant is a subject of debate. This review summarizes the current literature on these immunologically active factors in human milk, including the microbiome, innate factors, and maternal diet-derived dietary antigens in the context of development of allergic diseases, with the focus on food allergy.

Introduction

Atopic diseases are rapidly increasing worldwide with food allergy (FA) affecting 7.6% of children in the United States.[1] Genetics and environment can impact the development of atopic disease; the perinatal period is crucial as the gut microbiota is establishd and the immune system matures. Human milk (HM) has the ability to shape the maturing immune sys-

polyunsaturated fatty acid (PUFAs) and lactoperoxidase. The former have been recently extensively reviewed in the context of FA[5], which we will briefly summarize here. The focus of this review will be on the microbiome and innate factors which have not been extensively reviewed, and maternal diet-derived dietary antigens present in HM, but commonly come up in discussions with breastfeeding mothers.

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Jawahar Jagarapu, Rashmin C Savani

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Jawahar Jagarapu, Rashmin C. Savani

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Sara B. DeMauro, ... Hallam Hurt

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Pamela A. Geller, ... Chavis A. Patterson

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Meeting Families Where They Are: Institution, Evaluation, and Sustainability of Telemedicine Prenatal Neonatology Consultation in the COVID-19 Pandemic Health Emergency

Laura E Jackson, ...

FEEDBACK

https://youtu.be/e1EGUbF9LEA

https://youtu.be/aD-uqsxxKaY

Journal Pre-proof

Telemedicine use in neonatal follow-up programs - what can we do and what we can't - lessons learned from COVID-19

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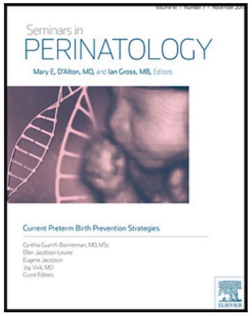

- Telemedicina en Neonatologia ha sido clásicamente utilizada para optimizar el soporte del manejo de los pacientes hospitalizados
  - Screening de ROP, interconsultas

- Pandemia COVID-19 —> Telemedicina como herramienta de seguimiento ambulatorio
  - Desventajas: pérdida de la relación médico – paciente, preferencias de los padres

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- Estudio piloto de telemedicina para seguimiento de pacientes dados de alta con HD de la Neo en Suiza en el 2016 demostró que los pacientes a los que se les realizó seguimiento telemático presentaron menos consultas al SUI en lo que duró su HD
  - Mayor seguridad para con los cuidados de sus niños

- Cleveland: proyecto piloto en el cual a todos los pacientes dados de alta de la Neo se les ofrece una consulta de 20 minutos por telemedicina posterior a la primera consulta pediátrica
  - 68% de las familias afirman que solucionaron todas sus dudas en la consulta telemática

Seguimiento Neonatal

Apoyo post alta a la familia

Coordinación de las consultas con subespecialistas

DSM enfocado en secuelas más frecuentes en PT y pacientes críticos

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- Hospital de niños de Filadelfia suspendió su seguimiento presencial y cambió a modo telemático entre Marzo y Junio del 2020
  - Actualmente funciona de manera mixta
  - Algunas familias optaban por seguimiento telefónico v/s telemedicina (conectividad)

- Se apoyaba con una app que instruía a los padres a cómo realizar la consulta:
  - Manta en el suelo, juguetes apropiados —> niño en movimiento para ser correctamente evaluado

- En los pacientes <12 meses que se encontraban en neurorehabilitación, el terapeuta podía estar presente durante la evaluación

Appendix 1:

Coordinator Script for Telehealth Visits

"Hello! <patient name> is scheduled for an appt with us on <date/time>. Because of the COVID-19 concerns, we are contacting families about changing appts to a video visit. Would you be interested in having a telehealth video visit?"
"During this COVID emergency, CHOP is offering telemedicine services. It is our intention that for these telemedicine visits you will not be financially responsible for more than you would be if you had an in-person visit." **(What Dept of Peds provided. Use as needed)**

***If YES to VIDEO visit and has an active MyCHOP account:**

1. "Great! *(Review date/time and provider(s) info with the family)*.
2. We also have a few reminders to review:
   a. Please log in to your MyCHOP account prior to your scheduled visit to complete questionnaires that may be assigned.
   b. *(If BH/med visit)*: "After your video visit with <provider's name> has ended, please exit the visit (*details if needed* → by tapping the screen and tapping the red phone icon). You'll then need to join the next visit with <provider's name> 10 minutes before the scheduled time of <time>."
   c. "Please be sure that <patient's name> is present for the visit."
   d. "Please make sure your phone is fully charged. If you have more than one visit with us, you may need to recharge your phone in between."
   e. "It may be helpful if you have someone else present during the visit to help hold the phone while you assist <patient's name> with some of the activities during the exam portion of the visit."
   f. "Try to have some favorite toys, books, and maybe a blanket ready to use for some floor time activities during the video visit. The providers will want to see how <patient's name> plays and moves. "
   g. "If you get disconnected, please try to log back into the visit."
   h. *"If you are having trouble with the sound, try holding the phone rather than laying it on a surface."*
   i. *"If you run into too many challenges with getting the video visit to work, call us (xxx-xx-xxxx) or text us (xxx-xxx-xxxx) to let us know and we can try to switch to a telephone visit."*
      - *You may want to reserve h. and i. if they contact you about connectivity issues.*
   j. "Please bear with us if we run into technical difficulties or challenges related to this visit. This is an entirely new process for all of us. Thank you!"
3. Ask about SW needs: "Would it be helpful if our Social Worker gave you a call?"

***If YES to VIDEO visit but does NOT have an active MyCHOP account:**

1. I can help you with that *(refer to the MyCHOP Instant Activation pdf on O drive and provide the family with their activation code)*
2. Review reminders above (See #2 – a-j, above)
3. Ask about SW needs: "Would it be helpful if our Social Worker gave you a call?"

***If NO to VIDEO visit but YES to TELEPHONE VISIT:**

1. Confirm the phone number to reach the family

2. Confirm an email address (so that the After Visit Summary can be emailed to the family—we won't have the capability to physically mail correspondence to the family at this time).
3. Confirm date and time of the appt
    a. Change visit type
        i. **TELEPHONE VISIT [2152]**
4. Ask about SW needs: "Would it be helpful if our Social Worker gave you a call?"

***If Cancelling because prefers In-Person appt:**

1. "Thank you. We understand your decision and will go ahead and cancel this appt. Because of the frequently changing status of the COVID-19 issues, we will not be able to reschedule the appt at this time. To avoid multiple rescheduling, will give you a call in the future to reschedule once we have a date to begin rescheduling patients."

Target Age – 12 months	Developmental Concepts to Observe and Related Toys	Clinician Prompts to Caregiver
Toys/Materials **Container with blocks or small toys** **Toy car/truck** **Doll or Stuffed animal** **Play dishes or cups** **Pop up toy or music box** **Crayon and paper** **Board book** **Ball**	**Cognitive Skills**	
	Imitation – **truck or car** Observe whether child imitates parent's actions	"Please roll a **truck or car** across the ground near your child. Then give your child the truck or car and ask them to do it." **"**Please clap your hands or make a face."
	Interactive Play – **ball, social game** Observe whether child plays, engages with parent	"Please roll a **ball** back and forth while sitting on the floor facing your child, and encourage your child to play with you." "Please initiate a **social game** such as peek-a-boo or pat-a-cake with your child."
	Attends to story – **board book** Observe child's attention to book, whether child looks at pictures, flips pages	"Please read the **board book** to your child."
	Communication Skills – *Expressive Language*	
	Imitates words Observe whether child imitates parent	"Please make animal sounds or other familiar sounds like "ah oh" or "Bye-bye."
	Uses finger to point to express needs	Observe or ask parent
	Communication Skills – *Receptive Language*	
	Understands "No" – **toy of interest** Observe whether child stops, does not pick up toy	"Please put a **toy** in front of your child but then tell your child "no" before they pick it up."
	Understands words for familiar objects Observe whether child looks at, points to, or retrieves the object	"Please ask your child a question they would know the answer to (e.g., where's bottle?)." "Please read to your child and ask him/her to point to objects in the book."
	Motor Skills – *Fine Motor*	
	Writing grasp –**crayon** Observe grasp and ability to make marks on paper	"Please show your child to make marks with a **crayon**."
	Stacking - **blocks** Observe how child picks up and stacks blocks	"Please show your child how to make a **block** tower with two blocks."
	Motor Skills - *Gross Motor*	
	Rolls, stands from laying down Observe how child gets up	"Please place your **child on his/her back** and let them get up."
	Takes steps without holding on – **object of interest**	"Encourage your child to walk towards you or towards an object of interest."
	Throws ball with a forward motion – **ball**	"Demonstrate throwing the **ball** and then ask your child to throw it."

Figure 2: Example of Guidelines for Behavioral Health Providers to Assess Development
Parents were sent a list of possible toys to have available during their telehealth visit. In this figure are listed a *few key milestones in each domain for a 12-month visit* (excerpted from a more comprehensive list) that the behavioral health provider could observe and ask a parent to help demonstrate. Similar lists were also developed for 6 months, 18 months, 24 months, 30 months, 3-4 years, and 4-5 years. *(Used with permission from the CHOP Neonatal Follow-up Behavioral Health Team)*

- Ventaja: elimina la brecha de oportunidad de acceso a seguimiento

- Desventaja: Bayleys o ADOS requieren evaluación presencial
  - Falta de regulación desde el punto de vista médico – legal