COVID-19

Conséquences maternelles, critères d'extraction

Alexandre VIVANTI, Alexandra BENACHI

Alexandre Vivanti (MD,PhD)

MCU-PH en Gynécologie-Obstétrique – CHU Antoine Béclère, Clamart

INSERM U1195 – Diseases and hormones of the nervous system

Faculté de Médecine Paris Saclay

Pas de conflits d'intérêt

Historique

- 30 décembre 2019 : Li Wenliang → 7 personnes contaminées par un nouveau coronavirus
- 31 décembre : La Chine informe l'OMS → groupe de cas de pneumonie. Identification d'un nouveau coronavirus → **2019-nCoV**
- 9 janvier 2020 : 1er décès officiel à Wuhan
- 13 janvier : 1er cas signalé hors Chine (Thaïlande)
- 24 janvier : 3 premiers cas confirmés en France (Bordeaux et Bichat)
- 14 février : 1er décès en France
- 16 mars : France → 6633 cas confirmés / 148 décès
- 17 mars : confinement en France

Recommandations initiales

Haut Conseil de la Santé Publique

14/03/2020

« S'agissant des femmes enceintes, **en l'absence de données disponibles**, il est recommandé d'appliquer les mesures ci-dessous à partir du troisième trimestre de la grossesse »

- Diagnostic par RT-PCR préconisé dès la suspicion clinique
- Mesures de distanciation / limitation des déplacements / téléconsultation
- Limitation des activités professionnelles, culturelles, sociales non essentielles

Recommandations initiales

16/03/2020

« Les connaissances à l'heure actuelle sont très limitées »

Précisions sur :

- Gestion des suspicions diagnostiques
- Critères d'hospitalisation conventionnelle / réanimation
- Prise en charge en salle de travail

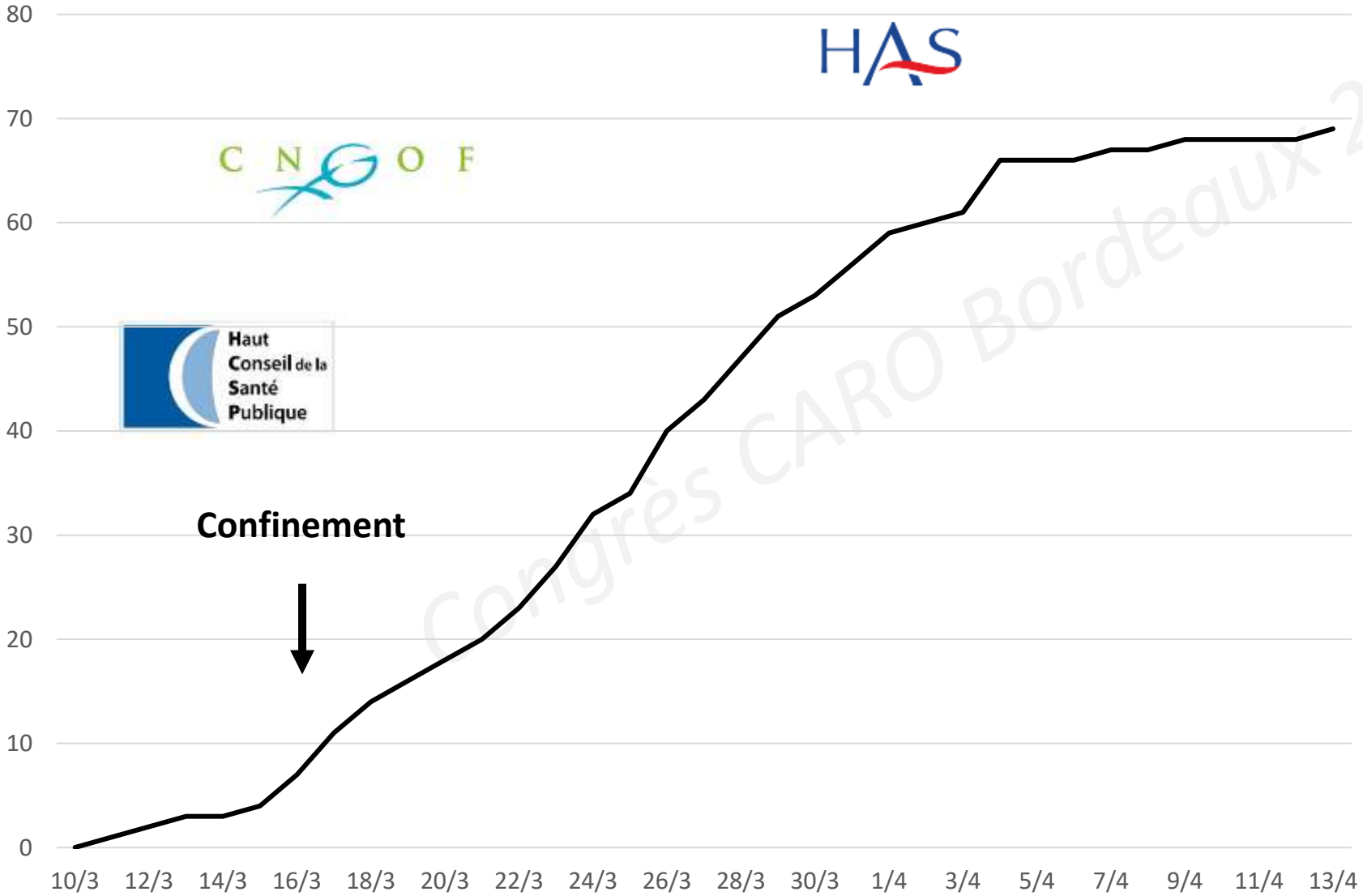
02/04/2020

Réponses rapides évolutives

- Suivi prénatal
- Femmes et bébés après l'accouchement

« Réponse rapide #1: les femmes enceintes 3ème trimestre sont considérées comme à risque de développer une forme sévère d'infection au COVID-19 »

Recommandations initiales



Incidence cumulée
Femmes enceintes
RT-PCR+

Béclère + Bicêtre + Louis Mourier

Recommandations initiales

- **01/03/2020: Covid-19 & Pregnancy → 10 références (Pubmed)**

- 01/10/2021: Covid-19 & Pregnancy → 3716 références (Pubmed)

Recommandations initiales

Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records

Huijun Chen, Juanjuan Guo*, Chen Wang*, Fan Luo, Xuechen Yu, Wei Zhang, Jiafu Li, Dongchi Zhao, Dan Xu, Qing Gong, Jing Liao, Huixia Yang, Wei Hou, Yuanzhen Zhang*

Lancet 2020
Published Online
February 12, 2020

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8	Patient 9	n (%)
Clinical characteristics										
Date of admission	Jan 20	Jan 25	Jan 27	Jan 26	Jan 27	Jan 27	Jan 28	Jan 29	Jan 30	–
Age (years)	33	27	40	26	26	26	29	28	34	–
Gestational age on admission	37 weeks, 2 days	38 weeks, 2 day	36 weeks	36 weeks, 2 days	38 weeks, 1 day	36 weeks, 3 days	36 weeks, 2 days	38 weeks	39 weeks, 4 days	–
Epidemiological history	Yes (exposure to relevant environment)*	Yes (contact with infected person)	Yes (contact with infected person)	Yes (exposure to relevant environment)*	Yes (exposure to relevant environment)*	Yes (contact with infected person)	Yes (contact with infected person)	Yes (contact with infected person)	Yes (exposure to relevant environment)†	9 (100%)
Other family members affected	No	Yes	Yes	No	No	Yes	No	Yes	No	4 (44%)
Onset to delivery (days)	1	6	4	3	1	4	2	2	7	–
Complications	Influenza	None	Gestational hypertension	Pre-eclampsia	Fetal distress	None	PROM	Fetal distress	PROM	–
Signs and symptoms										
Fever on admission	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	7 (78%)
Post-partum fever	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	6 (67%)
Myalgia	No	Yes	No	No	Yes	Yes	No	No	No	3 (33%)
Malaise	No	No	No	No	Yes	Yes	No	No	No	2 (22%)
Rigor	No	No	No	No	No	No	No	No	No	0
Cough	Yes	Yes	Yes	No	No	Yes	No	No	No	4 (44%)
Dyspnoea	No	No	No	Yes	No	No	No	No	No	1 (11%)
Sore throat	No	No	No	No	No	Yes	Yes	No	No	2 (22%)
Diarrhoea	No	No	No	Yes	No	No	No	No	No	1 (11%)
Chest pain	No	No	No	No	No	No	No	No	No	0

→ Diagnostic – Naissance < 7 jours

→ ARCF

→ 100% patientes symptomatiques

Recommandations initiales

Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records

Huijun Chen, Juanjuan Guo*, Chen Wang*, Fan Luo, Xuechen Yu, Wei Zhang, Jiafu Li, Dongchi Zhao, Dan Xu, Qing Gong, Jing Liao, Huixia Yang, Wei Hou, Yuanzhen Zhang*

Lancet 2020
Published Online
February 12, 2020

Laboratory characteristics	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8	Patient 9	n (%)
White blood cell count (× 10⁹ cells per L)	6·15	5·07	8·78	7·63	9·34	5·57	10·61	9·96	7·08	–
Low or normal leukocyte count (<9·5 × 10⁹ cells per L)	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	7 (78%)
Lymphocyte count (× 10⁹ cells per L)	1·59	0·56	0·46	2·83	0·69	0·66	0·87	1·53	1·47	–
Lymphopenia (<10⁹ cells per L)	No	Yes	Yes	No	Yes	Yes	Yes	No	No	5 (56%)
C-reactive protein concentration (mg/L)	20·3	14·4	33·4	3·3	28·2	18·2	NA	6·2	24·9	–
Elevated C-reactive protein (>10 mg/L)	Yes	Yes	Yes	No	Yes	Yes	NA	No	Yes	6 (75%)
Elevated ALT (>45 U/L) or AST (>35 U/L)	Yes	No	Yes	Yes	No	No	No	No	No	3 (33%)
ALT (U/L)	2093	9	62	54	18	14	6	16	12	–
AST (U/L)	1263	24	71	76	24	23	15	22	21	–
Confirmatory test done (SARS-CoV-2 quantitative RT-PCR)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9 (100%)

→ 50% lymphopénies

→ 75% élévation de la CRP

→ 33% cytolyse hépatique

Recommandations initiales

Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records

Huijun Chen, Juanjuan Guo*, Chen Wang*, Fan Luo, Xuechen Yu, Wei Zhang, Jiafu Li, Dongchi Zhao, Dan Xu, Qing Gong, Jing Liao, Huixia Yang, Wei Hou, Yuanzhen Zhang*

Lancet 2020
Published Online
February 12, 2020

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8	Patient 9	n (%)
Delivery										
Method of delivery	C-section	C-section	C-section	C-section	C-section	C-section	C-section	C-section	C-section	–
Indication for C-section	Severely elevated ALT or AST; COVID-19 pneumonia	Mature; COVID-19 pneumonia	History of C-section (×2); COVID-19 pneumonia	Pre-eclampsia; COVID-19 pneumonia	Fetal distress; COVID-19 pneumonia	History of stillbirth (×2); COVID-19 pneumonia	PROM; COVID-19 pneumonia	Fetal distress; COVID-19 pneumonia	PROM; COVID-19 pneumonia	–
Treatment after delivery										
Oxygen support (nasal cannula)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9 (100%)
Antiviral therapy	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	6 (67%)
Antibiotic therapy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9 (100%)
Use of corticosteroid	No	No	No	No	No	No	No	No	No	0

→ 100% césariennes

→ 100% oxygénothérapie

Recommandations initiales

Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records

Huijun Chen, Juanjuan Guo*, Chen Wang*, Fan Luo, Xuechen Yu, Wei Zhang, Jiafu Li, Dongchi Zhao, Dan Xu, Qing Gong, Jing Liao, Huixia Yang, Wei Hou, Yuanzhen Zhang*

Lancet 2020
Published Online
February 12, 2020

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8	Patient 9	n (%)
Gestational age at delivery	37 weeks, 2 days	38 weeks, 3 days	36 weeks	36 weeks, 2 days	38 weeks, 1 day	36 weeks, 3 days	36 weeks, 2 days	38 weeks	39 weeks, 4 days	..
Birthweight (g)	2870	3730	3820	1880	2970	3040	2460	2800	3530	..
Low birthweight (<2500 g)	No	No	No	Yes	No	No	Yes	No	No	2 (22%)
Premature delivery	No	No	Yes	Yes	No	Yes	Yes	No	No	4 (44%)
Apgar score (1 min, 5 min)	8, 9	9, 10	9, 10	8, 9	9, 10	9, 10	9, 10	9, 10	8, 10	..
Severe neonatal asphyxia	No	No	No	No	No	No	No	No	No	0
Neonatal death	No	No	No	No	No	No	No	No	No	0
Fetal death or stillbirth	No	No	No	No	No	No	No	No	No	0

→ 40% prématurité

Gestion obstétricale

Quelle gestion obstétricale ?

- Hospitalisation systématique ?
- Voie d'accouchement ?
- Que faire en cas d'infection d'une patiente à terme ?
- Quelles complications ?
- Que faire des anomalies biologiques ?

Gestion obstétricale en maternités de type III

Etude multicentrique observationnelle rétrospective

12 mars – 13 avril 2020

Toute femme enceinte >14SA & COVID19+

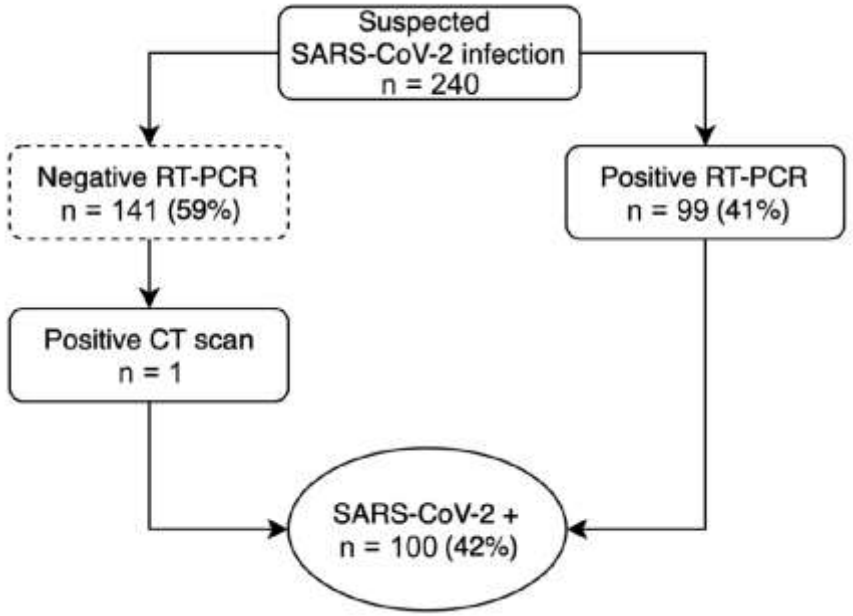


Table 1. Baseline characteristics at diagnosis for pregnant women infected with sever acute respiratory syndrome 2, France*

Maternal and obstetric characteristics	Value
Total patients	100
Median age, y (IQR)	33.7 (29–36.7)
Median gravidity (IQR)	3 (1.8–4)
Median parity (IQR)	1 (0–3)
Median BMI, kg/m^2 (IQR)	27.0 (23.5–30.6)
Preexisting conditions	
Diabetes mellitus	7 (7)
Chronic high blood pressure	6 (6)
Tobacco use	2 (2)
Asthma	9 (9)
Median gestational age at diagnosis, wk (IQR)	31.3 (25.6–35.6)
14–24	18 (18)
25–32	41 (41)
33–37	20 (20)
>37	20 (20)
Early postpartum	1 (1)
Signs and symptoms	
Fever	62 (62)
Cough	80 (80)
Dyspnea	30 (30)
Myalgia	26 (26)
Anosmia	16 (16)
Sore throat	9 (9)
Diarrhea or vomiting	10 (10)
Rash	0
Other signs	13 (13)

*Values are no. (%) except as indicated. BMI, body mass index; IQR, interquartile range.

Vivanti et al., Emerg Inf Dis

Gestion obstétricale en maternités de type III

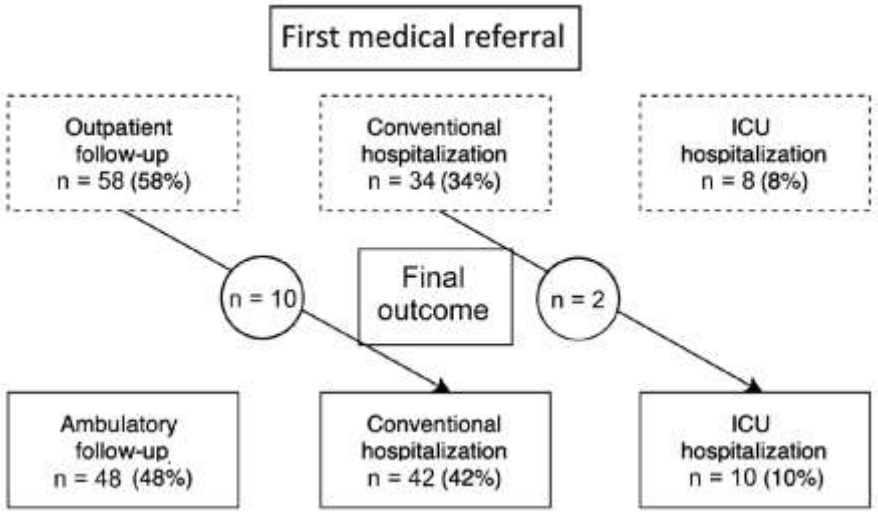


Table 2. Maternal and obstetric characteristics according to medical referral for pregnant women with severe acute respiratory syndrome 2 infection, France*

Characteristics	Non-ICU hospitalization, n = 90	ICU hospitalization, n = 10	p value
Median age, y (IQR)	33.2 (29.1–36.7)	33.6 (28.3–34.3)	0.89
Median BMI, kg/m^2 (IQR)	26.2 (23–29.7)	30.7 (29.8–33.1)	0.003
Underlying conditions, no. (%)			
Diabetes mellitus	7 (8)	0	1
Chronic high blood pressure	5 (6)	1 (10)	0.48
Tobacco use	2 (2)	0	1
Asthma	7 (8)	2 (20)	0.22
Median gestational age at diagnosis, wks (IQR)	31.3 (25–35.6)	28.5 (26.9–34.2)	0.78

*ICU, intensive care unit; IQR, interquartile range

Table 3. Laboratory parameters at diagnosis according to medical referral for pregnant women with severe acute respiratory syndrome 2 infection, France*

	Non-ICU hospitalization, n = 90		ICU hospitalization, n = 10		
Laboratory findings	Median (IQR)	No. (%)	Median (IQR)	No. (%)	p value
Hemoglobin, g/dL	11.4 (10.5–12.2)	64 (66.7)	9.8 (9.3–11.3)	9 (90)	0.02
Platelet count, × 10^9/L	230 (162–273)	63 (70.0)	205 (164–271)	9 (90)	0.98
Leukocyte count, × 10^9 cells/L	7.2 (5.4–8.9)	63 (70.0)	6.6 (6.1–7.2)	9 (90)	0.68
Lymphocyte count, × 10^9 cells/L	1.15 (0.9–1.6)	58 (64.4)	0.77 (0.7–1)	9 (90)	0.01
Lymphocytopenia, <1.00 × 10^9 cells/L	NA	21/58 (36.2)†	NA	8/9 (88.9)†	0.008
Prothrombin time, %	100 (99–100)	53 (58.9)	100 (100–100)	7 (70)	0.61
aPPT, ratio	1.06 (1–1.2)	52 (57.8)	1.12 (1–1.4)	7 (70)	0.16
Prolonged aPPT ratio (≥1.20)	NA	13/53 (24.5)†	NA	3/7 (43)†	0.38
Fibrinogen activity, g/L	4.8 (4–5.8)	45 (50.0)	5.1 (4.5–5.5)	6 (60)	0.73
AST, U/L	25 (20–35)	48 (53.3)	30 (22–59)	8 (80)	0.38
ALT, U/L	17 (11–32)	49 (54.4)	19 (12–48)	8 (80)	0.46
C-reactive protein, mg/L	23 (9–42)	53 (58.9)	27 (22–108)	8 (80)	0.15
Creatinine, µmol/L	47 (41–57)	45 (50.0)	50 (38–55)	7 (70)	0.94

*ALT, alanine aminotransferase; aPPT, activated partial thromboplastin time; AST, aspartate aminotransferase; ICU, intensive care unit; IQR, interquartile

Gestion obstétricale en maternités de type III

Outcomes obstétricaux et néonataux notables

- Prématurité : 40% dont la moitié avant 32SA
- MFIU : 0%
- Césariennes: 50% dont 80% pour un motif lié au COVID
- Coagulopathie sévère : 1 patiente
- NICU : 30% d'hospitalisations
- 1 cas de transmission verticale

Gestion obstétricale en maternités de type III

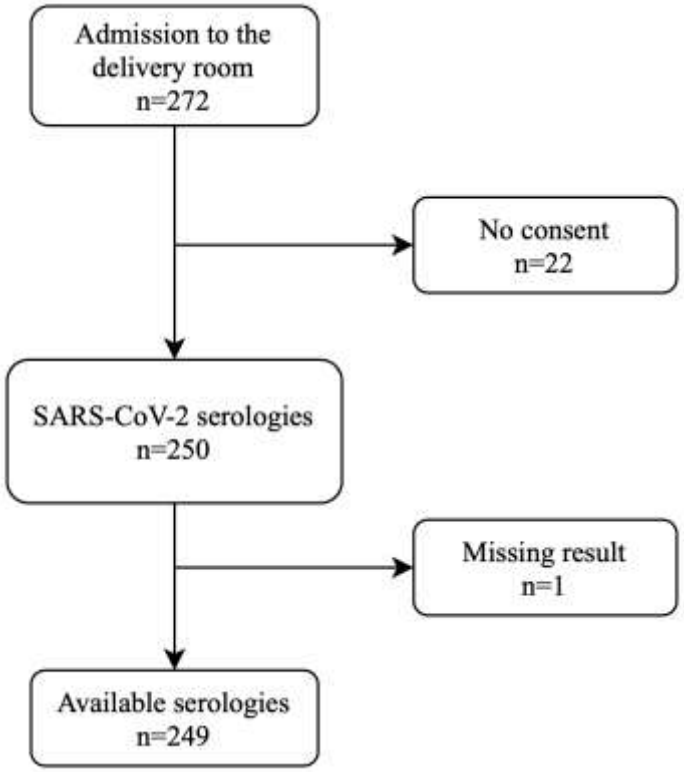
Outcomes notables : patientes en réanimation

- IOT : 9/10 (cut off débit O2 = 5L)
- SDRA : 6/10
- Délai O2 > 5L → IOT = 28 heures
- !! Corticothérapie de maturation fœtale !!
- Césariennes : 8/10
- 3 décompensations en post-partum
- Durée d'hospit mediane = 9J

ID	Age, y	BMI, kg/m^2	Underlying conditions	GA, wk, d		Time, h		Intubation, d	ICU stay, d	Drug regimens	Complications
				At diagnosis	At intubation	From O_2 >5 L/min to intubation	From intubation to delivery				
1	30.9†	35.8	NA	28, 5	29, 0	15.5	0	10	12	Lopinavir	NA
2	26.5†	29.9	NA	38, 1	POD 2	7	NA	15	16	Hydroxy	Surgical site infection
3	24.9†	25.7	Asthma	28, 5	30, 1	10	0	11	13	Lopinavir	Iatrogenic pancreatitis
4	32.6†	41.8	Hyper-tension	26, 0	26, 1	10.5	7	36	38	Lopinavir	Refractory hypoxemia
5	33.6	30.8	NA	26, 6	27, 6	5.5	0	2	3	NA	NA
6	39.4	31.3	Hashimoto thyroiditis	40, 5	POD 8	25	NA	4	5	NA	NA
7	33.1†	30.5	NA	23, 5	23, 5	1	Ongoing pregnancy	13	14	Hydroxy	Iatrogenic transient hepatitis
8	33.4	29.7	NA	28, 2	NA	NA	NA	NA	3	NA	NA
9	26.1	33.7	Asthma	36, 0	POD 1	24	NA	1	2	NA	NA
10	42.1†	29.3	NA	26, 6	27, 2	160	0	13	14	NA	NA

*BMI, body mass index; GA, gestational age; Hydroxy, hydroxychloroquine; ID, patient identification; NA, not applicable; POD, postoperative day.
†Patients who experienced acute respiratory distress syndrome before intubation.

Impact de la 1ère vague en France



Sortie du 1er confinement

4 mai → 31 mai

Parturientes de Béclère = RT-PCR + sérologie systématique

➔ Taux de positivité RT-PCR = 0.5%

➔ **Séroprévalence (IgG) = 8%**

➔ 47% des patientes IgG+ étaient asymptomatiques

	IgG-negative n=201	IgG-positive n=19	OR (95% CI)	p
Fever, n (%)	3 (1.5)	3 (15.8)	OR=12.9 (1.49-97.52)	0.009
Cough, n (%)	13 (6.5)	2 (10.5)	OR=1.69 (0.17-8.52)	0.62
Dyspnea, n (%)	12 (6)	1 (5.3)	OR=0.87 (0.02-6.6)	1
Myalgia, n (%)	14 (7)	7 (36.8)	OR=8.39 (2.19-25.46)	<0.001
Anosmia, n (%)	3 (1.5)	6 (31.6)	OR=29,2 (5.52-201)	<0.001
Diarrhea, n (%)	21 (10.4)	1 (5.3)	OR=0.47 (0.01-3.34)	0,7

Mattern et al., Plos One, 2020

Grossesse = facteur de risque ?

Multicentre case-control study (France / Belgium)

- Propensity score

→ Age / Diabetes mellitus / hypertension / Asthma / BMI

- Pregnant women vs non-pregnant women

TABLE 3
Comparison of primary and secondary outcomes between the 2 groups after applying the propensity score matching

Variable	Control group 1 (n = 107)	Case group 2 (n = 83)	Adjusted *P* value
Primary outcome			
ICU admission	2.38	11.08	.024
Secondary outcomes			
Hospital admission for COVID-19	17.4	58.21	<.001
Need for oxygen therapy	17.24	36.04	.006
Endotracheal intubation	1.67	10.16	.022

Data are presented as percentage.

COVID-19, coronavirus disease 2019; *ICU*, intensive care unit.

Badr. Coronavirus disease 2019 in pregnancy. Am J Obstet Gynecol 2020.

Badr et al., 2020

American register (CDC)

- 91 412 patientes

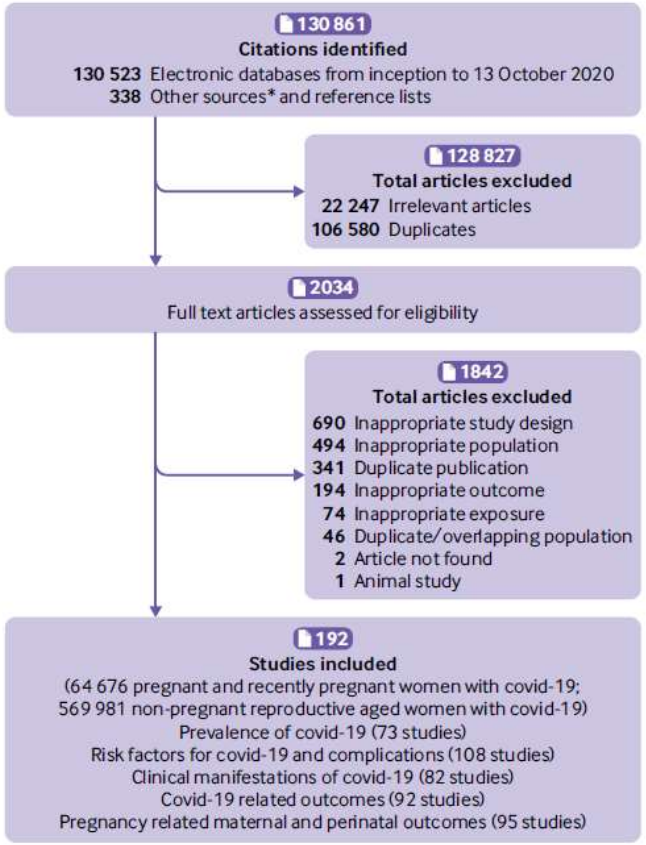
Outcome*	No. (%) Pregnant women (n = 8,207)	No. (%) Nonpregnant women (n = 83,205)	Crude risk ratio (95% CI)	Adjusted risk ratio† (95% CI)
Hospitalization§			5.4 (5.2–5.7)	5.4 (5.1–5.6)
All	2,587 (31.5)	4,840 (5.8)		
ICU admission††			1.6 (1.3–1.9)	1.5 (1.2–1.8)
All	120 (1.5)	757 (0.9)		
Mechanical ventilation¶¶			1.9 (1.4–2.6)	1.7 (1.2–2.4)
All	42 (0.5)	225 (0.3)		

Ellington et al., CDC

Complications maternelles

Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis

Allotey et al., BMJ 2020



- Pregnant women are less likely to have symptoms (OR: 0.28, 95% CI 0.13 to 0.62; I2=42.9%)

- Increased maternal age (1.83, 1.27 to 2.63; I2=43.4%)
- High body mass index (2.37, 1.83 to 3.07; I2=0%)
- Pre-existing maternal comorbidity (1.81, 1.49 to 2.20; I2=0%)
- Chronic hypertension (2.0, 1.14 to 3.48; I2=0%)
- Pre-existing diabetes (2.12, 1.62 to 2.78; I2=0%)
- Pre-eclampsia (4.21, 1.27 to 14.0; I2=0%) were associated with severe covid-19 in pregnancy.

- Pregnant women with covid-19 are more likely to experience preterm birth (1.47, 1.14 to 1.91; I2=18.6%) and their neonates are more likely to be admitted to a neonatal unit (4.89, 1.87 to 12.81, I2=96.2%).

Complications maternelles

JAMA Pediatrics | Original Investigation

Maternal and Neonatal Morbidity and Mortality Among Pregnant Women With and Without COVID-19 Infection
The INTERCOVID Multinational Cohort Study

March to October 2020
43 institutions in 18 countries
706 cases / 1424 controls

Table 1. Pregnancy Complications, Perinatal Events, and Neonatal Morbidities Among Women With and Without COVID-19 Diagnosis and Their Newborns

Characteristic	No. (%)		
	Women with COVID-19 diagnosis (n = 706)	Women without COVID-19 diagnosis (n = 1424)	Relative risk (95% CI)
Maternal morbidity and mortality index[a]	225 (31.9)	296 (20.8)	1.54 (1.33 to 1.78)[b]
Vaginal bleeding	44 (6.2)	87 (6.1)	1.02 (0.72 to 1.46)
Pregnancy-induced hypertension	58 (8.2)	80 (5.6)	1.46 (1.05 to 2.02)
Preeclampsia/eclampsia/HELLP	59 (8.4)	63 (4.4)	1.76 (1.27 to 2.43)[b]
Hemoglobin level <10 g/dL at >27 wk gestation	130 (18.4)	228 (16.0)	1.15 (0.91 to 1.45)
Preterm labor	52 (7.4)	88 (6.2)	1.20 (0.86 to 1.68)
Infections requiring antibiotics	25 (3.6)	16 (1.1)	3.38 (1.63 to 7.01)
Admitted to ICU	59 (8.4)	23 (1.6)	5.04 (3.13 to 8.10)
Time in ICU, mean (SD), d	7.3 (7.8)	2.0 (1.7)	3.73 (2.37 to 5.86)[c]
Referred for higher dependency care	6 (0.9)	1 (0.1)	6.07 (1.23 to 30.01)
Maternal death	11 (1.6)	1 (0.1)	22.26 (2.88 to 172.11)
Fetal distress	87 (12.3)	120 (8.4)	1.70 (1.06 to 2.75)[b]
Spontaneous initiation of labor	333 (47.2)	793 (55.7)	0.85 (0.77 to 0.93)
Induced labor	157 (22.3)	320 (22.5)	0.99 (0.84 to 1.18)
Cesarean delivery	346 (49.0)	547 (38.4)	1.28 (1.16 to 1.40)[b]
Prelabor rupture of membranes	114 (16.1)	262 (18.4)	0.87 (0.71 to 1.07)
Gestational age at birth, mean (SD), wk	37.9 (3.3)	38.5 (3.1)	−0.61 (−0.90 to −0.32)[d]
Preterm birth (<37 wk gestation)	159 (22.5)	194 (13.6)	1.59 (1.30 to 1.94)[e]
Spontaneous preterm birth	27 (3.8)	66 (4.6)	0.81 (0.52 to 1.27)
Medically indicated preterm birth	133 (18.8)	127 (8.9)	1.97 (1.56 to 2.51)[e]

preeclampsia/eclampsia (RR, 1.76; 95%CI, 1.27-2.43)

severe infections (RR, 3.38; 95%CI, 1.63-7.01)

intensive care unit admission (RR, 5.04; 95%CI, 3.13-8.10)

maternal mortality (RR, 22.3; 95%CI, 2.88-172)

preterm birth (RR, 1.59; 95%CI, 1.30-1.94)

medically indicated preterm birth (RR, 1.97; 95% CI, 1.56-2.51)

Deaths : n=11
- 4 Severe preeclampsia
- 5 prenatal worsening respiratory failure
- 2 postnatal worsening respiratory failure

Complications maternelles

Venous thromboembolism

USA register, n= 460 000
0.2% vs 0.1% (OR 3.43, 95% CI 2.01-5.82)

Jering et al., JAMA inter med, 2021

Systematic review ; n=1063
0.3%, 95% CI 0.0 to 0.6

Servante et al., BMC Pregnancy Chilbirth, 2021

USA observational cohort ; n = 1219
- severe–critical illness: 6% (6/141)
- mild–moderate: 0.2% (1/499)
- Asymptomatic: 0% (0/579)

p=.001

Metz et al., Obstet Gynecol, 2021

Coagulation disorder

Table 3 Summary of reported cases of disseminated intravascular coagulation (DIC) or coagulopathy in pregnant women with confirmed COVID-19

		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
Study number		48 (Canada)	48	67	67	50	118	NUH/UHL	155	101	81
Classification of coagulopathy		DIC in pregnancy score 27	DIC in pregnancy score 27	Authors stated DIC	Authors stated coagulopathy	Authors state mild coagulopathy, DIC in pregnancy score 27	Authors stated coagulopathy	Authors stated DIC	Authors stated DIC	DIC in pregnancy score 27	Authors stated DIC
Maternal outcome		Recovered	Recovered	Died	Remains in Hospital	Remains on ICU	Died	Died	Recovered (after termination of pregnancy)	Remains in hospital	Recovered
Haematological indices	Platelets (minimum and maximum if multiple values reported)	82	54	122–188	122–170	114	40–119	57	33–94	required *10 injections of platelets)	57
	APTT (normal range)	41 (18.5–29.9)	60 (28.0–41.9)			35.1	PTT 30.1–30.6	49.3 (24–33)	PTT 44.6–27.7	PTT 36	
	Prothrombin Time					20.2	10.6–10.9	23.9	12.7	16	
	INR	1.0	1.1			1.7	0.94–0.97	1.8			
	Fibrinogen (g/L) *Normal 2.48–5.06 (3rd trimes ster)*	2.2	0.8					1.1	Mg/dL < 60–275		
	D Dimer (mg/L) *normal 0.13–1.7*	25.79	> 20				6.5	19.06	> 33.89		
	Minimum ISTH Pregnancy DIC Score with available values	27	27			27		N/A (postpartum)	26	27	
	Minimum DIC score (ISTH)	4	5				2	6	6		

Servante et al., BMC Pregnancy Chilbirth, 2021

Critères d'extraction

COVID MATERNEL SEVERE

Critères réanimatoires

EXPECTATIVE

NAISSANCE

Poursuite de la grossesse

Corticothérapie
Sulfate de magnésium
Optiflow
IOT

Naissance si instabilité
- Respiratoire
- Hémodynamique

Corticothérapie
Sulfate de magnésium (<32SA)
Optiflow

Naissance si indication d'IOT

Naissance

Critères d'extraction

COVID MATERNEL SEVERE

Severe fetal brain damage subsequent to acute maternal hypoxemic deterioration in COVID-19

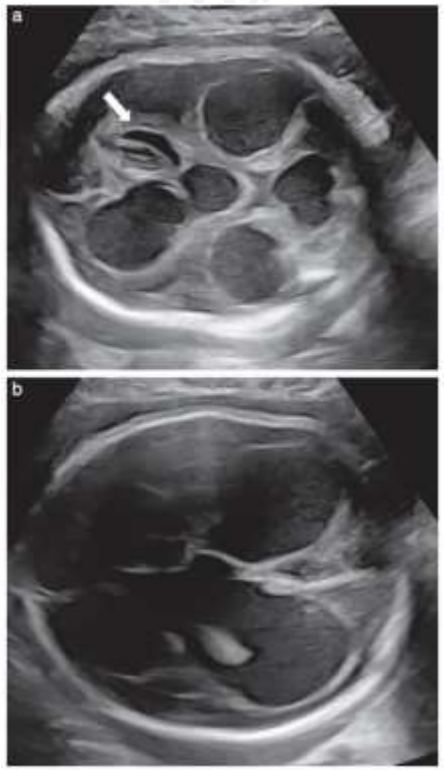
Düppers et al., Ultrasound Obstet Gynecol 2021

36 ans
G6P4
25SA+5J : COVID
26SA+5 : Hypoxémie
Mise sous ECMO
Choc + IRA
Catécholamines + hémodialyse
Bradycardie foetale mais extraction impossible

27SA+2 : Sevrage de l'ECMO

27SA : écho foetale normale
27SA 1/2 —> cf clichés

30SA+3 IMG



Hydrocéphalie
Hémorragie intraventriculaire
Destruction du parenchyme

Critères d'extraction

ATTEINTE PLACENTAIRE SEVERE

ARTICLE

https://doi.org/10.1038/s41467-020-17436-6 OPEN

Transplacental transmission of SARS-CoV-2 infection

Alexandre J. Vivanti[1,6], Christelle Vauloup-Fellous[2,8], Sophie Prevot[3], Veronique Zupan[4], Cecile Suffee[5], Jeremy Do Cao[6], Alexandra Benachi[1] & Daniele De Luca[4,7]

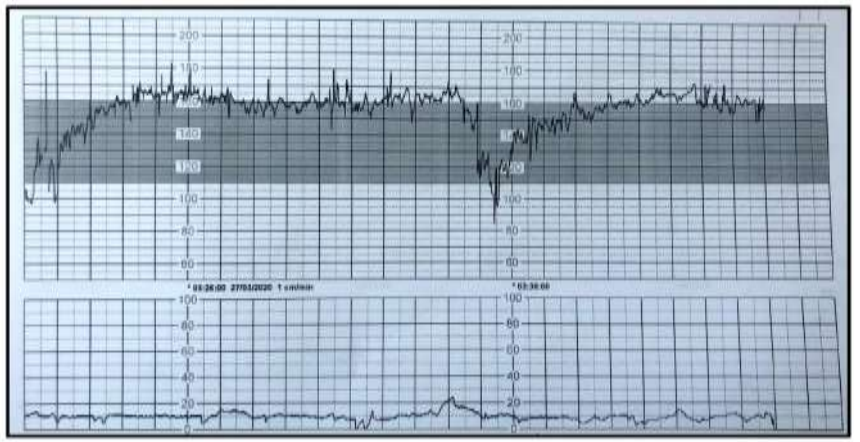
nature COMMUNICATIONS

- Patiente de 23 ans, G1P0

  35SA+2

  Fièvre (38,6°c), toux depuis 2 jours

- Biologie:
  - CRP = 37 mg/L
  - Lymphocytes = 540 x10^6 /L
  - TCA = 60s
  - Plaquettes = 54 x10^9 /L
  - Fg = 0,8 g/L
  - D-Dimères >20 mg/L
  - ASAT = 81 ; ALAT = 41



- ➔ Césarienne en urgence après Fg 3g et Acide tranexamique 1g

Critères d'extraction

ATTEINTE PLACENTAIRE SEVERE

ARTICLE
https://doi.org/10.1038/s41467-020-17436-6 OPEN

Transplacental transmission of SARS-CoV-2 infection

Alexandre J. Vivanti[1,8], Christelle Vauloup-Fellous[2,8], Sophie Prevot[3], Veronique Zupan[4], Cecile Suffee[5], Jeremy Do Cao[6], Alexandra Benachi[1] & Daniele De Luca[4,7]

nature COMMUNICATIONS

Versant maternel

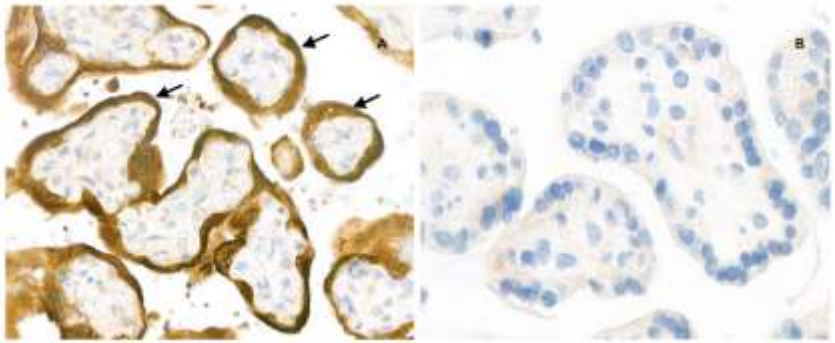
→ Correction des troubles de l'hémostase à J1

→ Sortie à J5

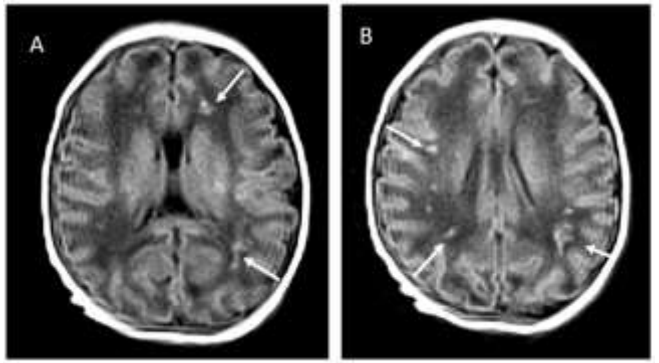
Mother		Neonate	
Sample	**Viral load (Log)**	**Sample**	**Viral load (Log)**
Nasopharyngeal swab	4.22	Blood	1.15
Vaginal swab	0.63	Nasopharyngeal swab (DOL1)	2.21
Placenta	11.15	Rectal swab	4.71
Amniotic fluid	2.09	Nasopharyngeal swab (DOL3)	7.30
Blood	4.87	Nasopharyngeal swab (DOL18)	4.54

Versant néonatal

→ Garçon de 2540g ; Apgar 4/2/7 ; pHa=7.25



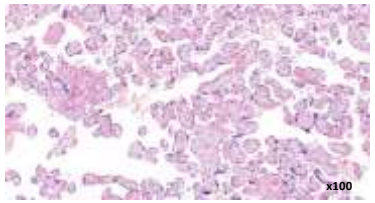
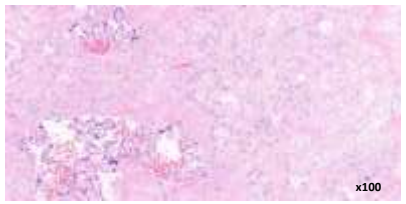
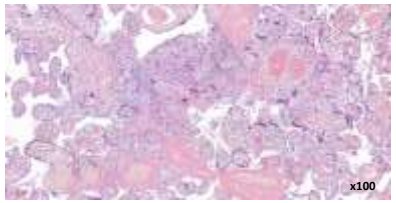
Marquage SARS-CoV-2 N-protein



Hypersignaux périventriculaires / sous-corticaux / substance blanche

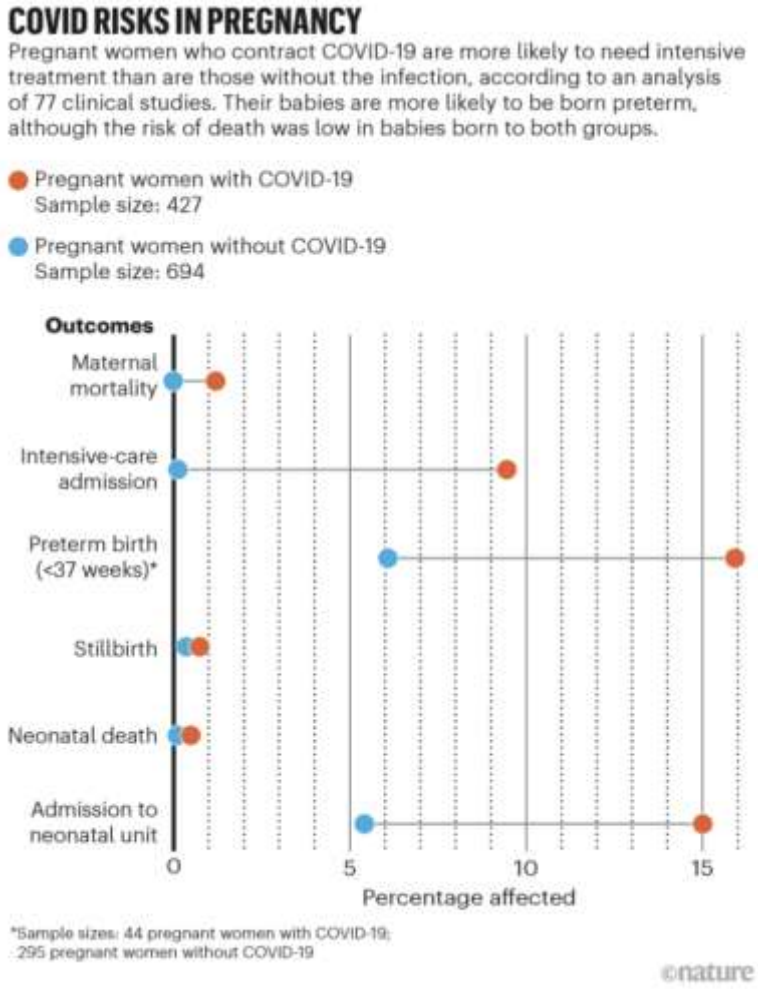
Critères d'extraction

ATTEINTE PLACENTAIRE SEVERE

	Placenta (-)	Placenta (+) N-né (-)	Placenta (+) N-né (+)
Fibrine			
Intervillite			
Immunomarquage Protéine N			

Vivanti et al., soumis

Conclusion



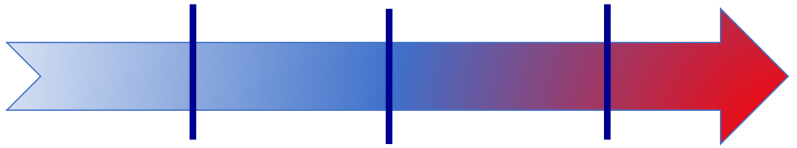
Allotey et al., BMJ 2020

Prématurité

Risque maternel

EXPECTATIVE **EXTRACTION**

20SA **24SA** **30SA** **34SA** **41SA**



Remerciements

Gynécologie-Obstétrique (Antoine Béclère)
- Dr Julie Carrara
- Dr Mélanie Vandekerckhove
- Dr Alexandra Letourneau
- Dr Mathilde Weber
- Dr Hoda Zakaria
- Dr Lina Bajjani
- Dr Anne-Gaël Cordier

Département d'Anesthésie-Réanimation (Antoine Béclère)
- Dr Agnès Le Gouez
- Pr Frédéric Mercier

Gynécologie-Obstétrique
- Pr Jacques Jani (Brugmann – Belgique)
- Dr Dominique Badr (Brugmann – Belgique)
- Pr Olivier Picone (Louis Mourier)
- Dr Larissa El Hachem (CH Sud Francilien)
- Dr Luc Rigonnot (CH Sud Francilien)

Réanimation Néonatale (Antoine Béclère)
- Pr Daniele De Luca
- Dr Roberto Raschetti
- Dr Barbara Loi

Département de Virologie (Paul Brousse)
- Dr Christelle Vauloup-Fellous

Département de Bactériologie (Antoine Béclère)
- Pr Florence Doucet-Populaire
- Dr Nadège Bourgeois-Nicolaos

Département d'Anatomopathologie (Antoine Béclère)
- Pr Sophie Prévot
- Dr Astrid Laurent-Bellue

Réanimation Polyvalente (Antoine Béclère)
- Dr Charles Damoisel


54ÈME Congrès National du
CARO
CLUB D'ANESTHÉSIE
RÉANIMATION EN OBSTÉTRIQUE
NANCY
20 & 21 MAI 2022
WWW.CARO-CONGRES.FR
Caro