Neonatology

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Neo Red

Postnatal Corticosteroids Policy for Very Preterm Infants and Bronchopulmonary Dysplasia

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Que conocemos del tema ?

Los Corticoides Postnatales son efectivos para reducir la DBP en prematuros extremos, pero se asocian con efectos adversos como alteraciones en el neurodesarrollo a la larga.

Cual es el objetivo del estudio?

Evaluar si el bajo uso de PNC es un factor de mayor riesgo para mortalidad y DBP en prematuros extremos.

Método.-

11 países de EPICE
105 UCI Neonatales
3126 RNPT 24s y 29s+6d

- **Estudio basado en un cohorte prospectivo de todos lo nacimientos de RNPT de 22s a 31s+6d.**

- **Periodo de 1 año Marzo 2011 a Marzo 2012.**

- **Recopilación de datos:**
  Cuestionarios estandarizados

➢ Registros obstétricos y neonatales.
➢ Jefes de cada unidad.

Método:

Población 1 - Incuyeron:

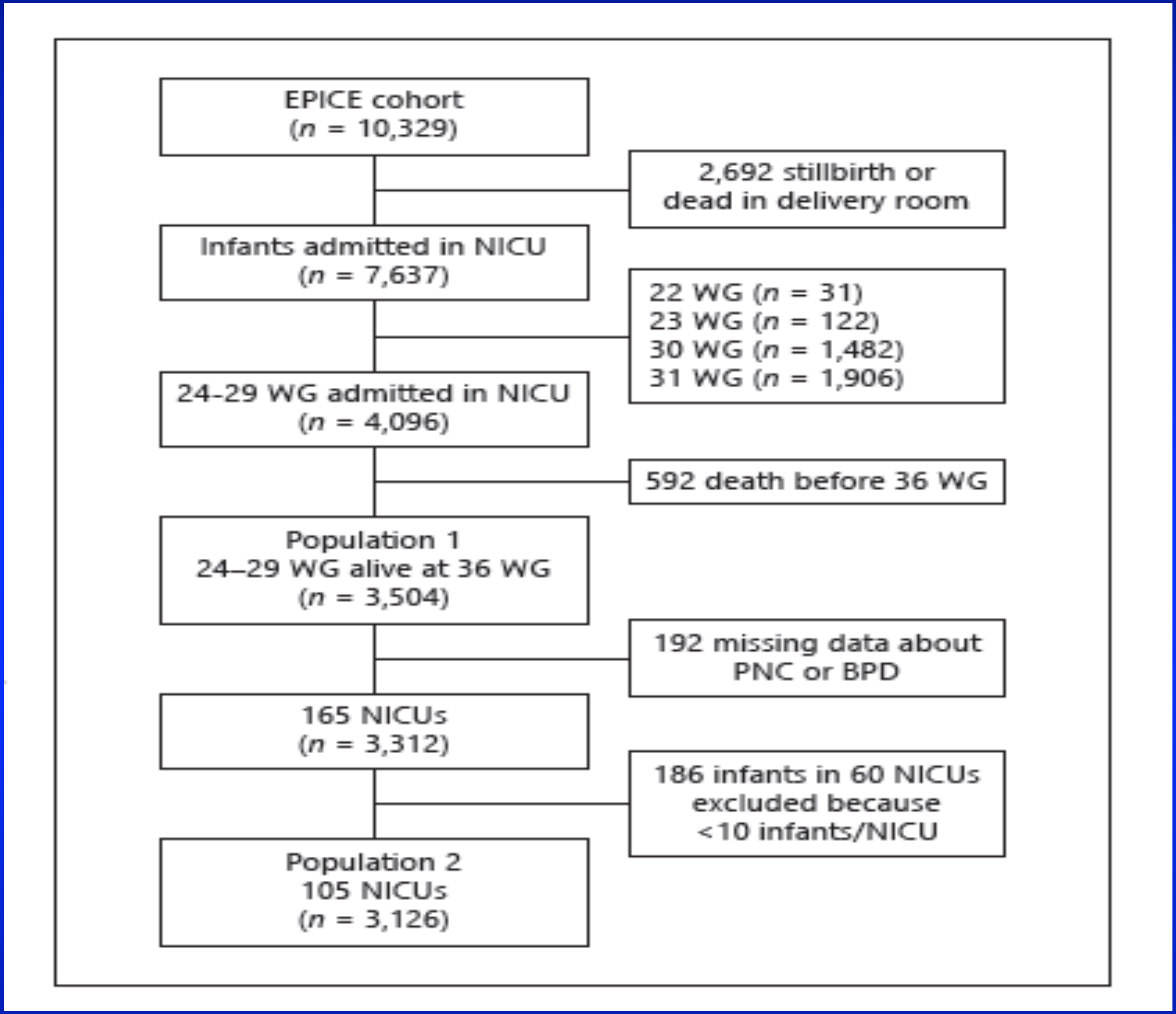
RNPT 24s y 29s+6d.
Menores de 24s: Manejo muy heterogéneo
Mayores de 29s+6d: menor riesgo de DBP.

Población 2 – Excluyeron :

RNPT con datos faltantes de información sobre DBP o PNC.
Se excluyeron 10 UCI que reportaban < de 10 pacientes durante el tiempo de estudio.

Outcome estudiados.-

- DBP moderada a severa según la definición del NICHD.
- Tasa de mortalidad en < de 36s que se encontraban hospitalizados. (Grupo de RNPT de 24s a 31s+6d).
- El uso de esteroide utilizado.



EPICE cohort
(*n* = 10,329)

2,692 stillbirth or
dead in delivery room

Infants admitted in NICU
(*n* = 7,637)

22 WG (*n* = 31)
23 WG (*n* = 122)
30 WG (*n* = 1,482)
31 WG (*n* = 1,906)

24–29 WG admitted in NICU
(*n* = 4,096)

592 death before 36 WG

Population 1
24–29 WG alive at 36 WG
(*n* = 3,504)

192 missing data about
PNC or BPD

165 NICUs
(*n* = 3,312)

186 infants in 60 NICUs
excluded because
<10 infants/NICU

Population 2
105 NICUs
(*n* = 3,126)

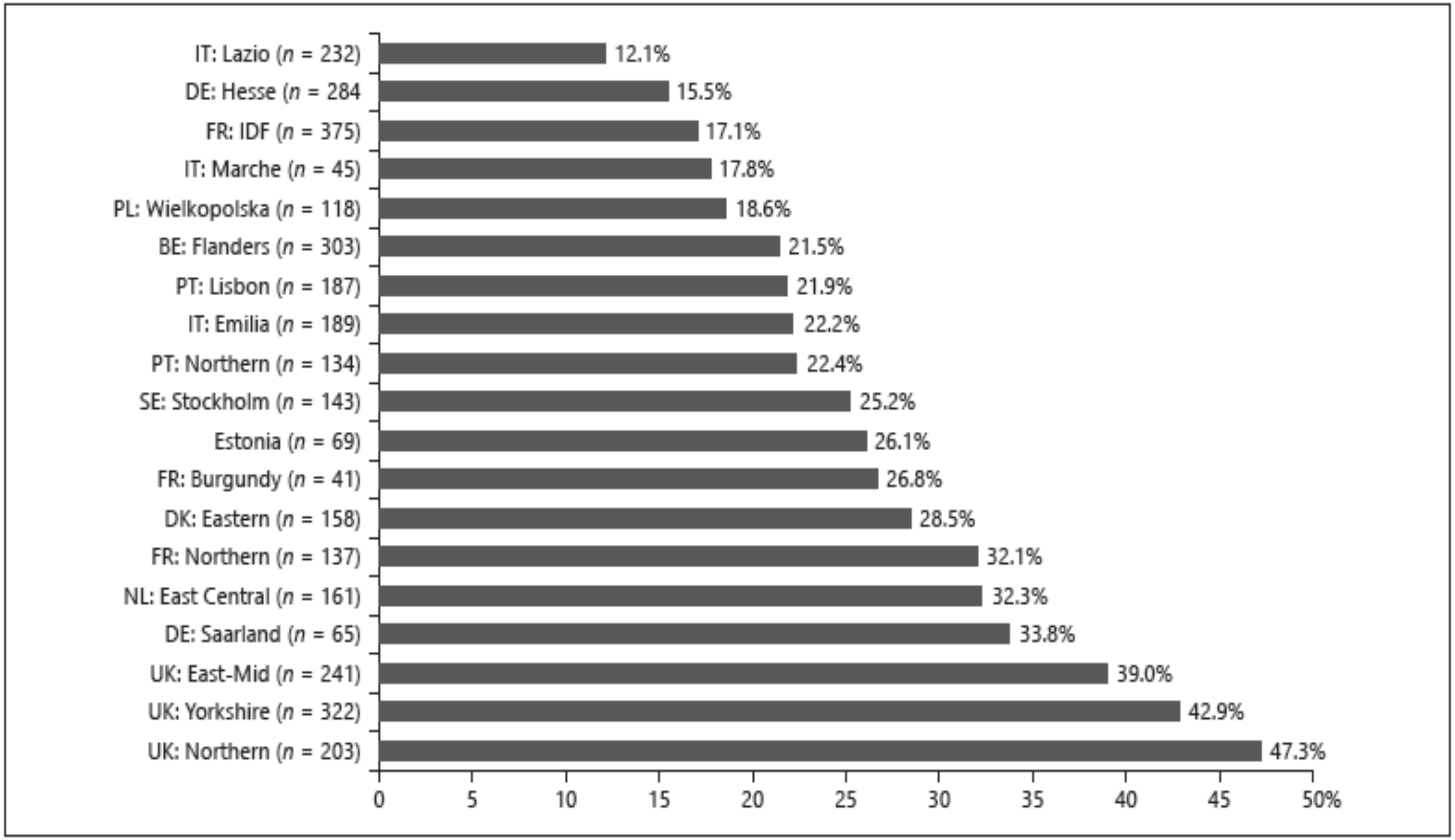


Fig. 2. Bronchopulmonary dysplasia (BPD) rate by region. PT, Portugal; PL, Poland; UK, United Kingdom; SE, Sweden; DK, Denmark; FR, France; IDF, Ile de France; DE, Germany; IT, Italy; NL, The Netherlands; BE, Belgium.

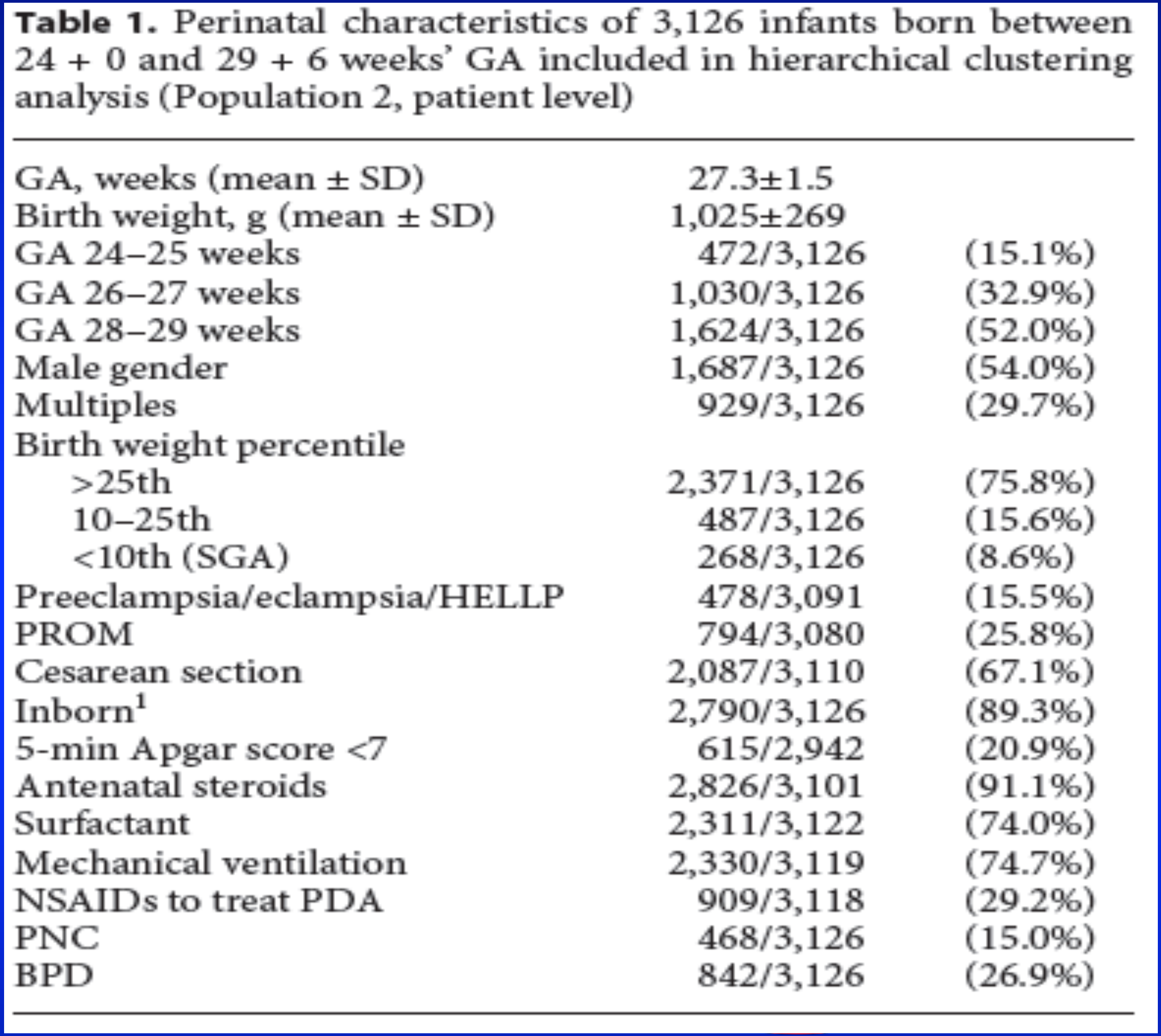


Table 1. Perinatal characteristics of 3,126 infants born between 24 + 0 and 29 + 6 weeks' GA included in hierarchical clustering analysis (Population 2, patient level)

GA, weeks (mean ± SD)	27.3±1.5	
Birth weight, g (mean ± SD)	1,025±269	
GA 24–25 weeks	472/3,126	(15.1%)
GA 26–27 weeks	1,030/3,126	(32.9%)
GA 28–29 weeks	1,624/3,126	(52.0%)
Male gender	1,687/3,126	(54.0%)
Multiples	929/3,126	(29.7%)
Birth weight percentile		
>25th	2,371/3,126	(75.8%)
10–25th	487/3,126	(15.6%)
<10th (SGA)	268/3,126	(8.6%)
Preeclampsia/eclampsia/HELLP	478/3,091	(15.5%)
PROM	794/3,080	(25.8%)
Cesarean section	2,087/3,110	(67.1%)
Inborn[1]	2,790/3,126	(89.3%)
5-min Apgar score <7	615/2,942	(20.9%)
Antenatal steroids	2,826/3,101	(91.1%)
Surfactant	2,311/3,122	(74.0%)
Mechanical ventilation	2,330/3,119	(74.7%)
NSAIDs to treat PDA	909/3,118	(29.2%)
PNC	468/3,126	(15.0%)
BPD	842/3,126	(26.9%)

Se agruparon 3 grupos.-

1. UCIN con poco uso de PNC y bajas tasas de DBP.

2. UCIN con uso bajo a moderado de PNC y un alto riesgo de desarrollar DBP.

3. UCIN con alto uso PNC y una tasa moderada de DBP.

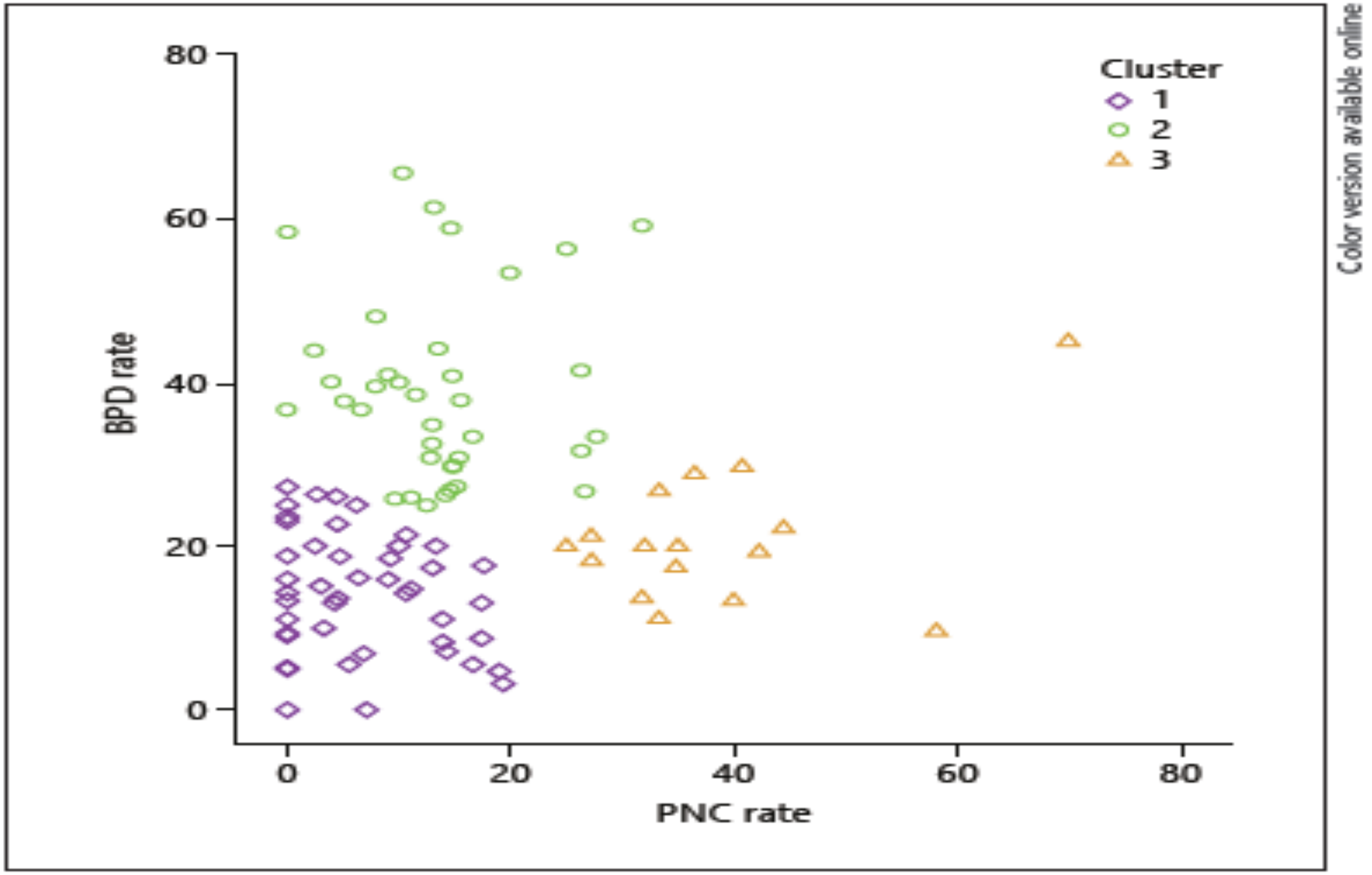


Fig. 3. Scatter plot of NICUs by PNC and BPD rates. Cluster 1 = low PNC and low BPD, cluster 2 = high BPD, cluster 3 = high PNC. PNC, postnatal corticosteroids; BPD, bronchopulmonary dysplasia.

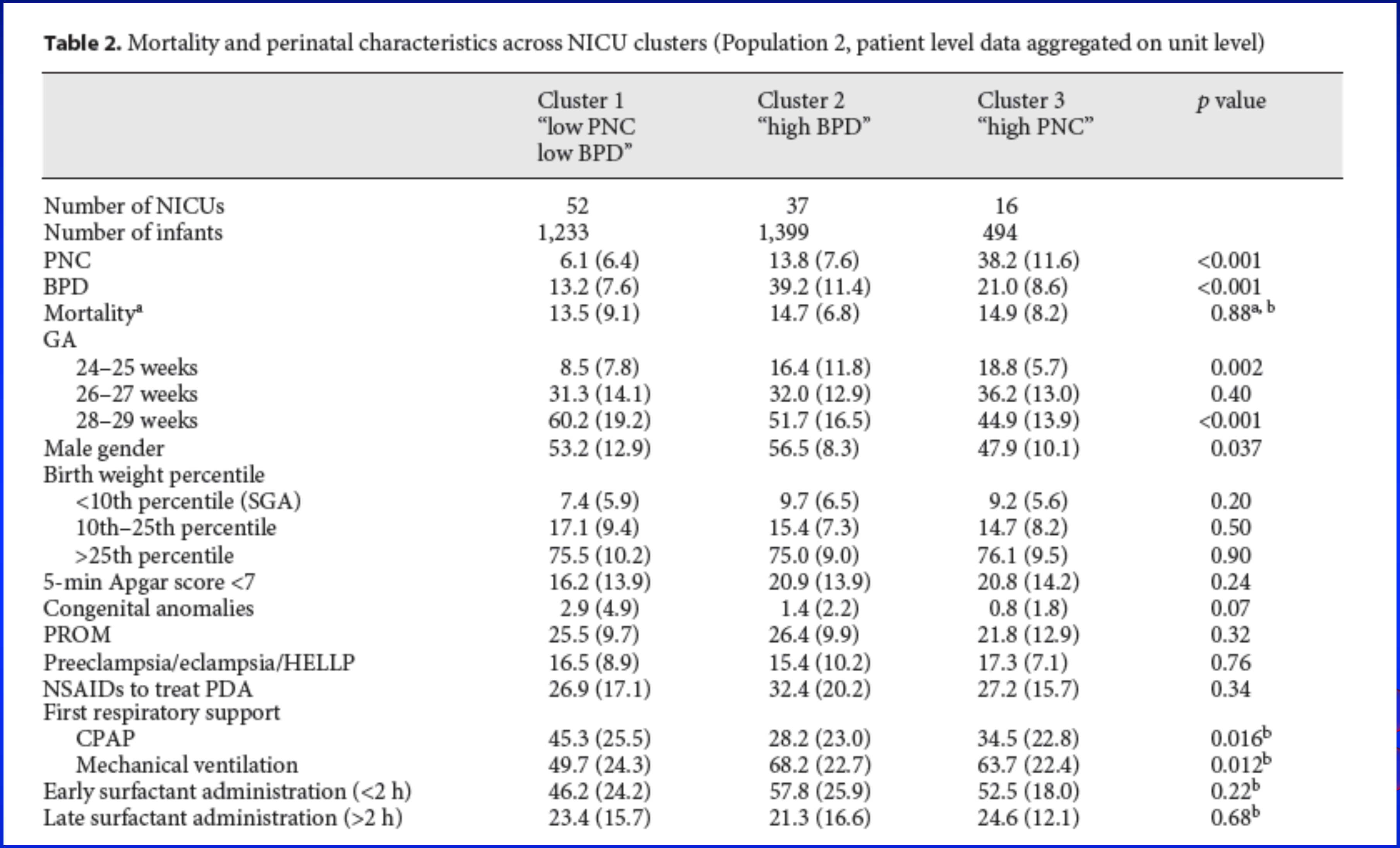


Table 2. Mortality and perinatal characteristics across NICU clusters (Population 2, patient level data aggregated on unit level)

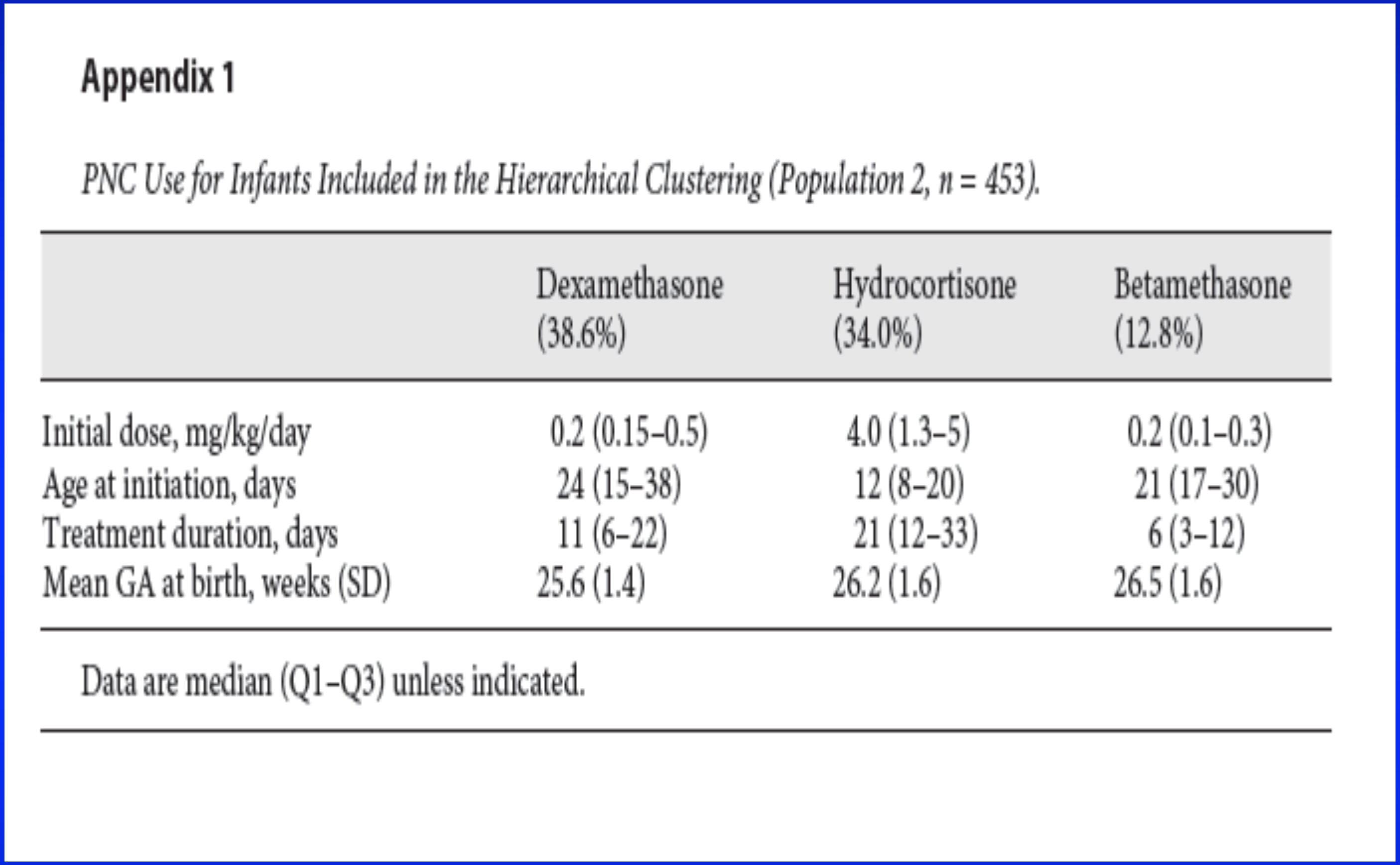
	Cluster 1 "low PNC low BPD"	Cluster 2 "high BPD"	Cluster 3 "high PNC"	*p* value
Number of NICUs	52	37	16	
Number of infants	1,233	1,399	494	
PNC	6.1 (6.4)	13.8 (7.6)	38.2 (11.6)	<0.001
BPD	13.2 (7.6)	39.2 (11.4)	21.0 (8.6)	<0.001
Mortality[a]	13.5 (9.1)	14.7 (6.8)	14.9 (8.2)	0.88[a, b]
GA				
24–25 weeks	8.5 (7.8)	16.4 (11.8)	18.8 (5.7)	0.002
26–27 weeks	31.3 (14.1)	32.0 (12.9)	36.2 (13.0)	0.40
28–29 weeks	60.2 (19.2)	51.7 (16.5)	44.9 (13.9)	<0.001
Male gender	53.2 (12.9)	56.5 (8.3)	47.9 (10.1)	0.037
Birth weight percentile				
<10th percentile (SGA)	7.4 (5.9)	9.7 (6.5)	9.2 (5.6)	0.20
10th–25th percentile	17.1 (9.4)	15.4 (7.3)	14.7 (8.2)	0.50
>25th percentile	75.5 (10.2)	75.0 (9.0)	76.1 (9.5)	0.90
5-min Apgar score <7	16.2 (13.9)	20.9 (13.9)	20.8 (14.2)	0.24
Congenital anomalies	2.9 (4.9)	1.4 (2.2)	0.8 (1.8)	0.07
PROM	25.5 (9.7)	26.4 (9.9)	21.8 (12.9)	0.32
Preeclampsia/eclampsia/HELLP	16.5 (8.9)	15.4 (10.2)	17.3 (7.1)	0.76
NSAIDs to treat PDA	26.9 (17.1)	32.4 (20.2)	27.2 (15.7)	0.34
First respiratory support				
CPAP	45.3 (25.5)	28.2 (23.0)	34.5 (22.8)	0.016[b]
Mechanical ventilation	49.7 (24.3)	68.2 (22.7)	63.7 (22.4)	0.012[b]
Early surfactant administration (<2 h)	46.2 (24.2)	57.8 (25.9)	52.5 (18.0)	0.22[b]
Late surfactant administration (>2 h)	23.4 (15.7)	21.3 (16.6)	24.6 (12.1)	0.68[b]

Conclusiones.-

✓ El estudio demuestra un grupo de UCIN con bajo uso de PNC y bajas tasas de DBP sin aumento de la mortalidad.

✓ NO se encontró un aumento de riesgo para el desarrollo de DBP en una política de uso restringido de PNC.

✓ Promover a tener un protocolo de uso de PNC para casos excepcionales y evitar los efectos adversos de estos a largo plazo.

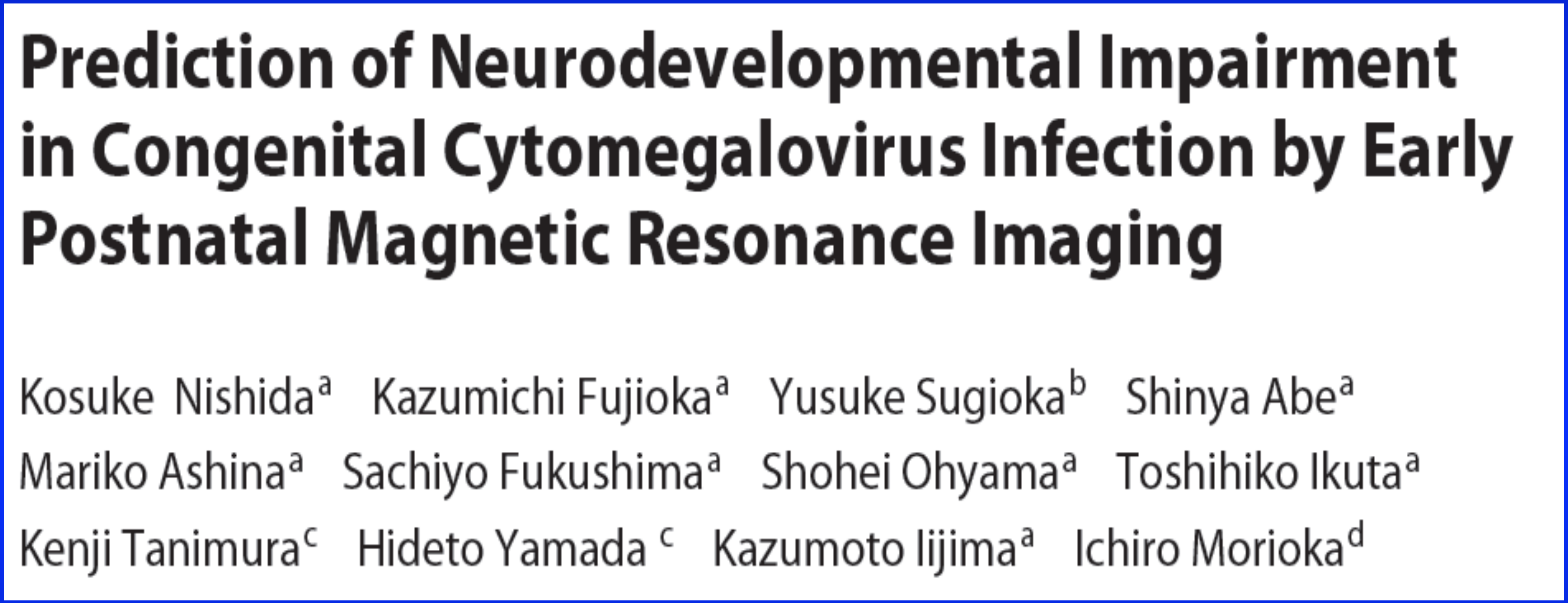


Appendix 1

PNC Use for Infants Included in the Hierarchical Clustering (Population 2, n = 453).

	Dexamethasone (38.6%)	Hydrocortisone (34.0%)	Betamethasone (12.8%)
Initial dose, mg/kg/day	0.2 (0.15–0.5)	4.0 (1.3–5)	0.2 (0.1–0.3)
Age at initiation, days	24 (15–38)	12 (8–20)	21 (17–30)
Treatment duration, days	11 (6–22)	21 (12–33)	6 (3–12)
Mean GA at birth, weeks (SD)	25.6 (1.4)	26.2 (1.6)	26.5 (1.6)

Data are median (Q1–Q3) unless indicated.



Prediction of Neurodevelopmental Impairment in Congenital Cytomegalovirus Infection by Early Postnatal Magnetic Resonance Imaging

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Que conocemos del tema ?

La infección del CMV congénito puede provocar alteraciones en el neurodesarrollo.

Cual es el objetivo del estudio?

Investigar el potencial de la Resonancia de cerebro para predecir alteraciones en el desarrollo neurológico.

Abril 2010 a Octubre 2018

Método.-

Kobe Children´s Hospital – Kobe - Japan
N= 42 pacientes

Estudio de cohorte prospectivo en todos los RN sospechosos de CMV.

- Se tomo PCR CMV en Orina (primeros 21ddv)
  Se midieron cargas virales cuantitativas.
- Resonancia de cerebro (dentro de los 3m de vida).
- Seguimiento del neurodesarrollo a los 18m.

Métodos:

Pacientes CMV (+) que ingresaban durante el 1er mes de vida con/sin síntomas recibían Tx:

Valganciclovir 32mg/Kg/d x 6s (2009 -2015)
32mg/Kg/d x 6m (2016-2017)

Paciente sintomático se definía si presentaba:

- Hepatoesplenomegalia
- Alteraciones de pruebas hepáticas
- Trombocitopenia
- Alteraciones oculares
- Alteraciones auditivas

Métodos:

Resonancia de cerebro:

- Ventriculomegalia
- Quistes Periventriculares
- Displasia del Hipocampo
- Hipoplasia Cerebelosa
- Anomalías en la sustancia blanca
- Trastornos de Migración

Evaluada por Radiólogo Pediatra (ciego)

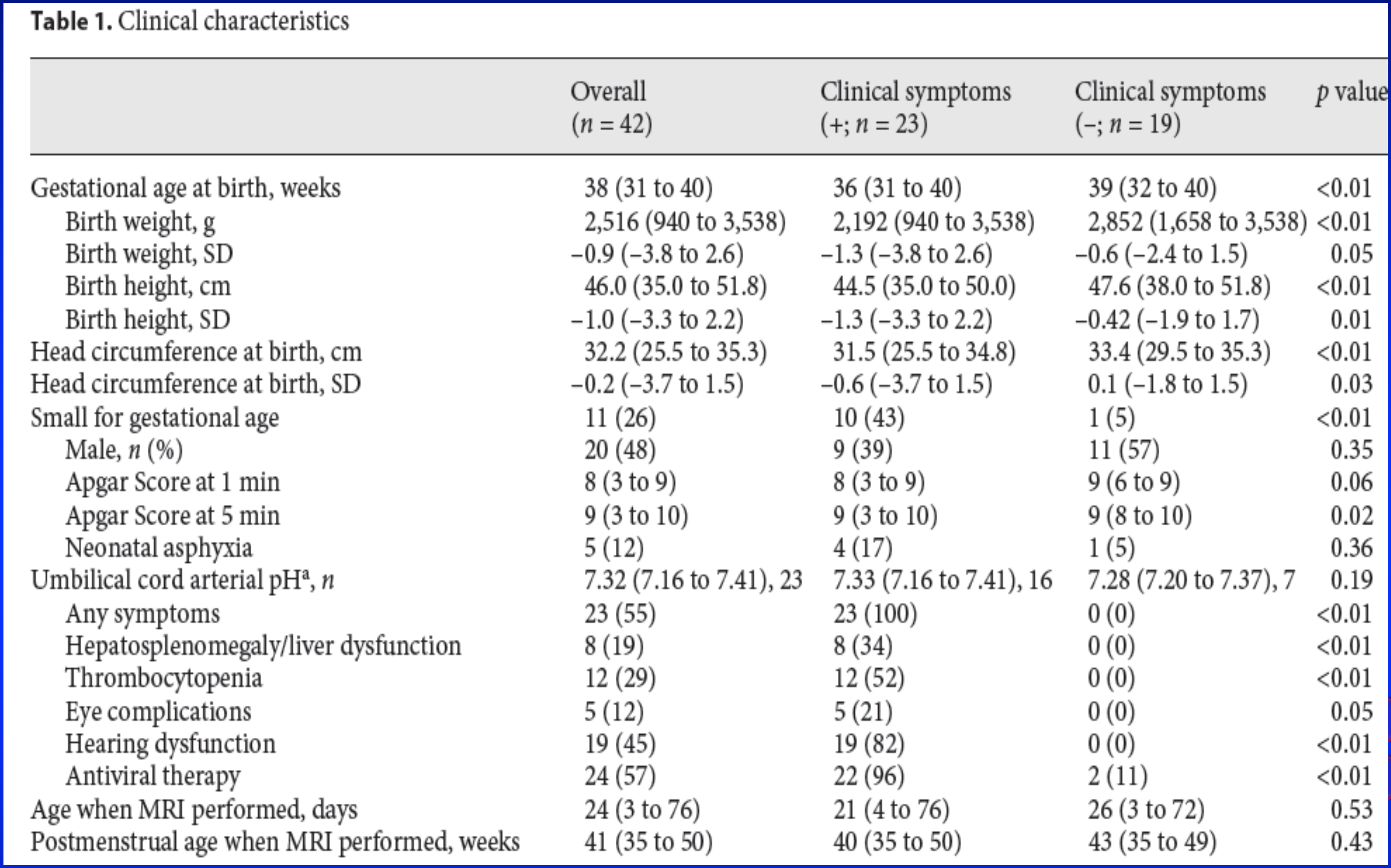


Table 1. Clinical characteristics

	Overall ($n = 42$)	Clinical symptoms (+; $n = 23$)	Clinical symptoms (–; $n = 19$)	*p* value
Gestational age at birth, weeks	38 (31 to 40)	36 (31 to 40)	39 (32 to 40)	<0.01
Birth weight, g	2,516 (940 to 3,538)	2,192 (940 to 3,538)	2,852 (1,658 to 3,538)	<0.01
Birth weight, SD	–0.9 (–3.8 to 2.6)	–1.3 (–3.8 to 2.6)	–0.6 (–2.4 to 1.5)	0.05
Birth height, cm	46.0 (35.0 to 51.8)	44.5 (35.0 to 50.0)	47.6 (38.0 to 51.8)	<0.01
Birth height, SD	–1.0 (–3.3 to 2.2)	–1.3 (–3.3 to 2.2)	–0.42 (–1.9 to 1.7)	0.01
Head circumference at birth, cm	32.2 (25.5 to 35.3)	31.5 (25.5 to 34.8)	33.4 (29.5 to 35.3)	<0.01
Head circumference at birth, SD	–0.2 (–3.7 to 1.5)	–0.6 (–3.7 to 1.5)	0.1 (–1.8 to 1.5)	0.03
Small for gestational age	11 (26)	10 (43)	1 (5)	<0.01
Male, *n* (%)	20 (48)	9 (39)	11 (57)	0.35
Apgar Score at 1 min	8 (3 to 9)	8 (3 to 9)	9 (6 to 9)	0.06
Apgar Score at 5 min	9 (3 to 10)	9 (3 to 10)	9 (8 to 10)	0.02
Neonatal asphyxia	5 (12)	4 (17)	1 (5)	0.36
Umbilical cord arterial pH[a], *n*	7.32 (7.16 to 7.41), 23	7.33 (7.16 to 7.41), 16	7.28 (7.20 to 7.37), 7	0.19
Any symptoms	23 (55)	23 (100)	0 (0)	<0.01
Hepatosplenomegaly/liver dysfunction	8 (19)	8 (34)	0 (0)	<0.01
Thrombocytopenia	12 (29)	12 (52)	0 (0)	<0.01
Eye complications	5 (12)	5 (21)	0 (0)	0.05
Hearing dysfunction	19 (45)	19 (82)	0 (0)	<0.01
Antiviral therapy	24 (57)	22 (96)	2 (11)	<0.01
Age when MRI performed, days	24 (3 to 76)	21 (4 to 76)	26 (3 to 72)	0.53
Postmenstrual age when MRI performed, weeks	41 (35 to 50)	40 (35 to 50)	43 (35 to 49)	0.43

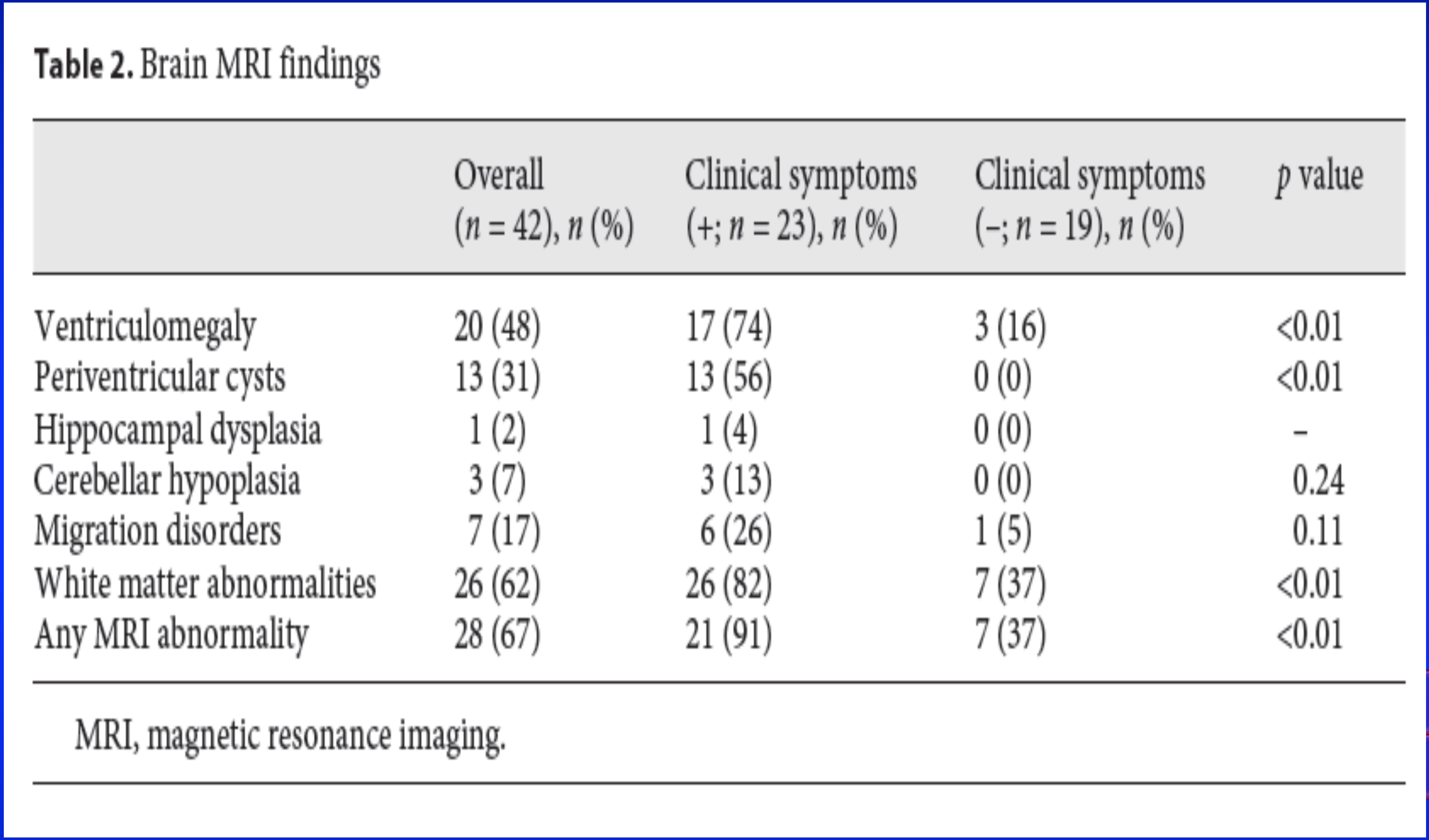


Table 2. Brain MRI findings

	Overall ($n = 42$), n (%)	Clinical symptoms (+; $n = 23$), n (%)	Clinical symptoms (–; $n = 19$), n (%)	p value
Ventriculomegaly	20 (48)	17 (74)	3 (16)	<0.01
Periventricular cysts	13 (31)	13 (56)	0 (0)	<0.01
Hippocampal dysplasia	1 (2)	1 (4)	0 (0)	–
Cerebellar hypoplasia	3 (7)	3 (13)	0 (0)	0.24
Migration disorders	7 (17)	6 (26)	1 (5)	0.11
White matter abnormalities	26 (62)	26 (82)	7 (37)	<0.01
Any MRI abnormality	28 (67)	21 (91)	7 (37)	<0.01

MRI, magnetic resonance imaging.

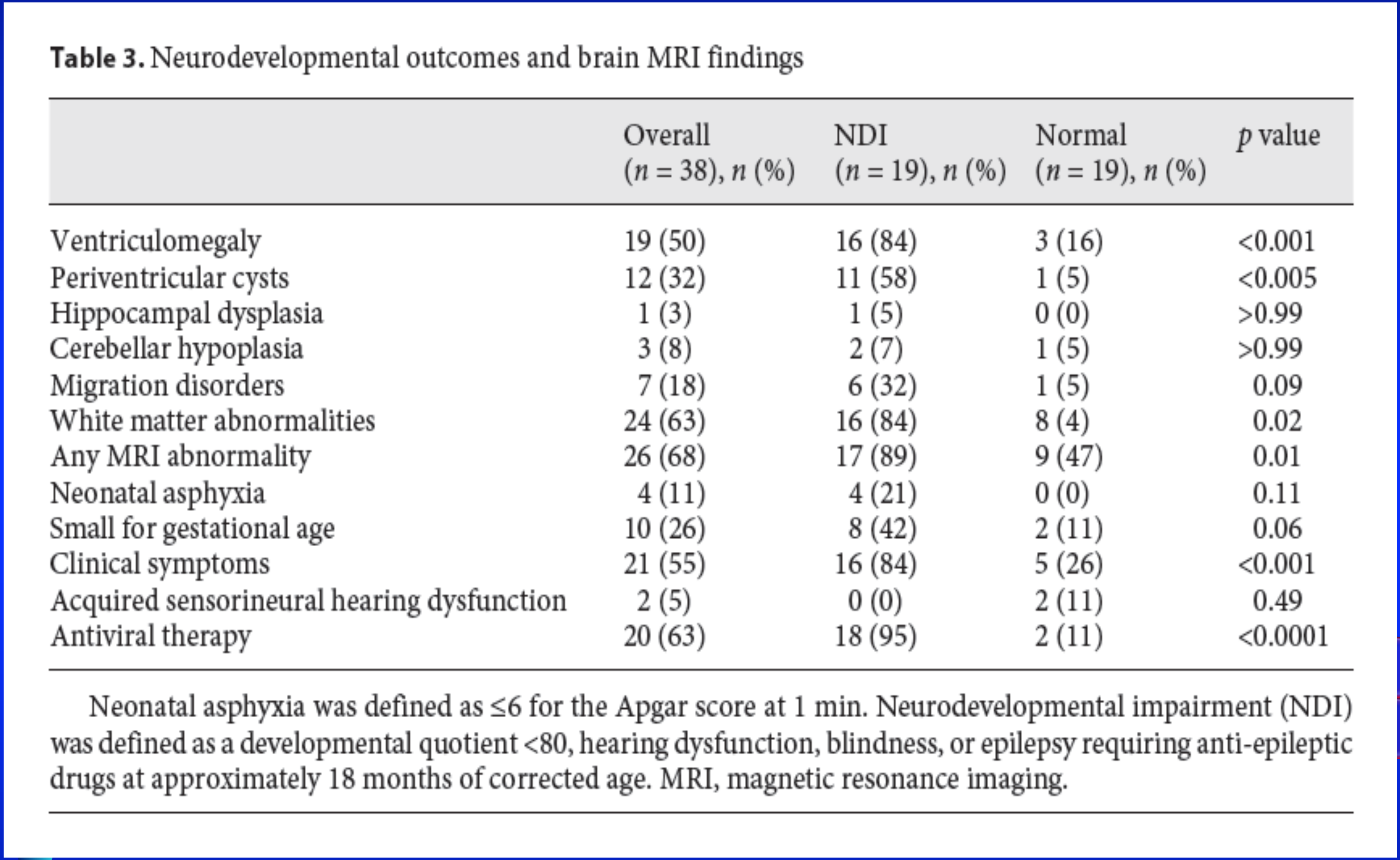


Table 3. Neurodevelopmental outcomes and brain MRI findings

	Overall ($n = 38$), n (%)	NDI ($n = 19$), n (%)	Normal ($n = 19$), n (%)	p value
Ventriculomegaly	19 (50)	16 (84)	3 (16)	<0.001
Periventricular cysts	12 (32)	11 (58)	1 (5)	<0.005
Hippocampal dysplasia	1 (3)	1 (5)	0 (0)	>0.99
Cerebellar hypoplasia	3 (8)	2 (7)	1 (5)	>0.99
Migration disorders	7 (18)	6 (32)	1 (5)	0.09
White matter abnormalities	24 (63)	16 (84)	8 (4)	0.02
Any MRI abnormality	26 (68)	17 (89)	9 (47)	0.01
Neonatal asphyxia	4 (11)	4 (21)	0 (0)	0.11
Small for gestational age	10 (26)	8 (42)	2 (11)	0.06
Clinical symptoms	21 (55)	16 (84)	5 (26)	<0.001
Acquired sensorineural hearing dysfunction	2 (5)	0 (0)	2 (11)	0.49
Antiviral therapy	20 (63)	18 (95)	2 (11)	<0.0001

Neonatal asphyxia was defined as ≤6 for the Apgar score at 1 min. Neurodevelopmental impairment (NDI) was defined as a developmental quotient <80, hearing dysfunction, blindness, or epilepsy requiring anti-epileptic drugs at approximately 18 months of corrected age. MRI, magnetic resonance imaging.

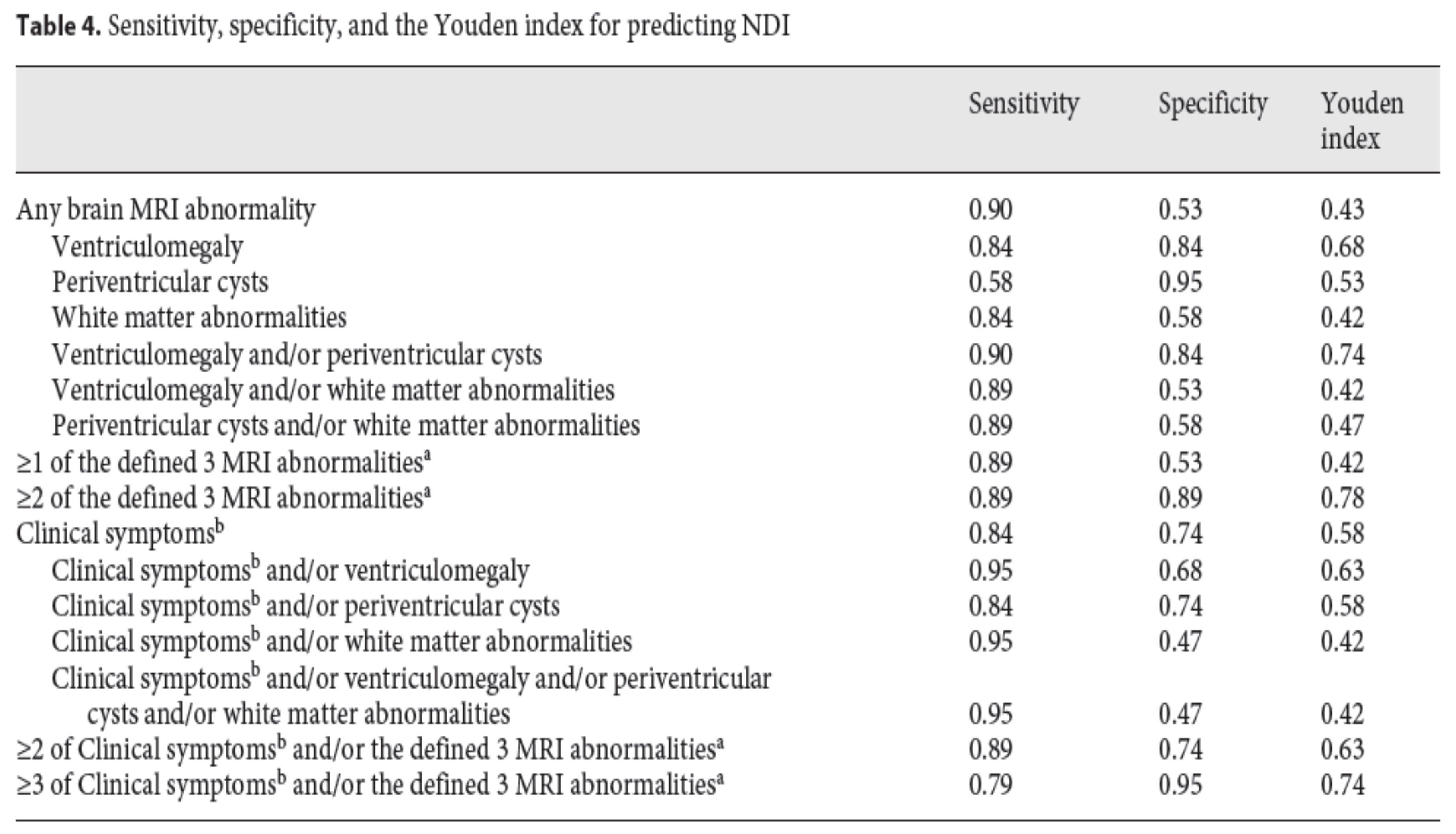


Table 4. Sensitivity, specificity, and the Youden index for predicting NDI

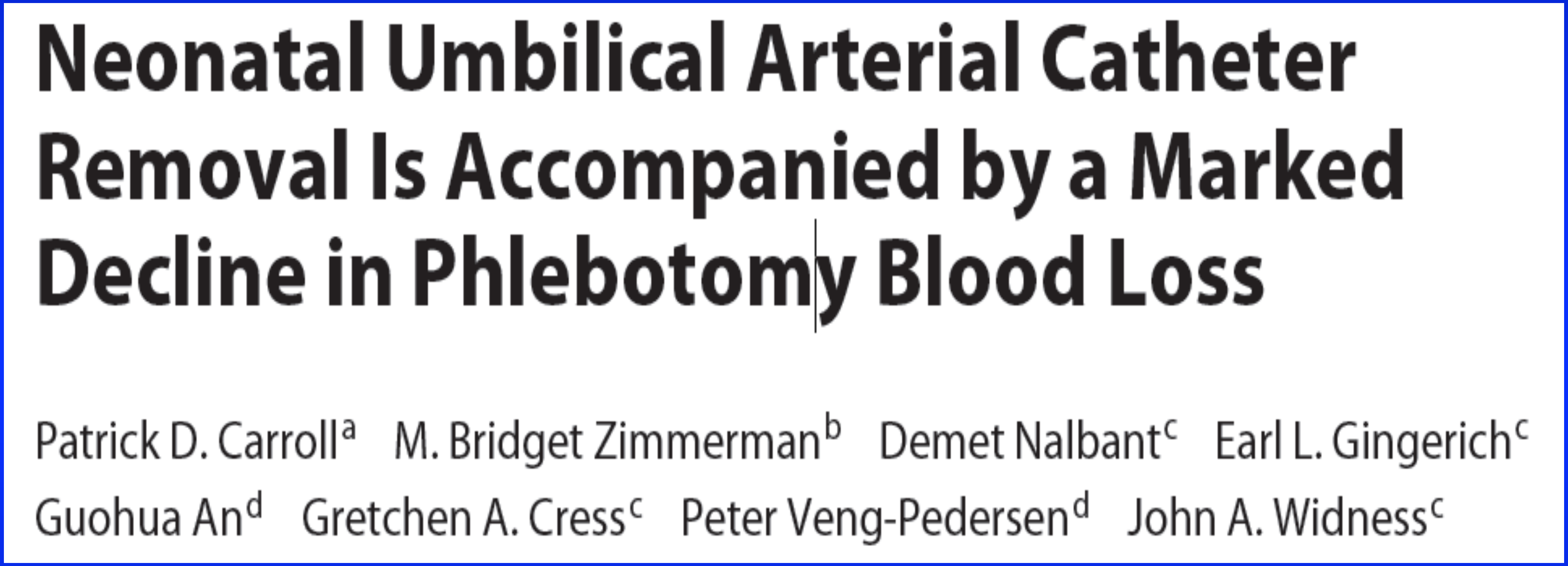
	Sensitivity	Specificity	Youden index
Any brain MRI abnormality	0.90	0.53	0.43
Ventriculomegaly	0.84	0.84	0.68
Periventricular cysts	0.58	0.95	0.53
White matter abnormalities	0.84	0.58	0.42
Ventriculomegaly and/or periventricular cysts	0.90	0.84	0.74
Ventriculomegaly and/or white matter abnormalities	0.89	0.53	0.42
Periventricular cysts and/or white matter abnormalities	0.89	0.58	0.47
≥1 of the defined 3 MRI abnormalities[a]	0.89	0.53	0.42
≥2 of the defined 3 MRI abnormalities[a]	0.89	0.89	0.78
Clinical symptoms[b]	0.84	0.74	0.58
Clinical symptoms[b] and/or ventriculomegaly	0.95	0.68	0.63
Clinical symptoms[b] and/or periventricular cysts	0.84	0.74	0.58
Clinical symptoms[b] and/or white matter abnormalities	0.95	0.47	0.42
Clinical symptoms[b] and/or ventriculomegaly and/or periventricular cysts and/or white matter abnormalities	0.95	0.47	0.42
≥2 of Clinical symptoms[b] and/or the defined 3 MRI abnormalities[a]	0.89	0.74	0.63
≥3 of Clinical symptoms[b] and/or the defined 3 MRI abnormalities[a]	0.79	0.95	0.74

Conclusiones.-

- ✓ Se detectan mayor cantidad de anomalías en las imágenes cerebrales dentro de los 3m posteriores al nacimiento en pacientes CMV congénito (+).

- ✓ Lactantes que presenta 2 de:
  Ventriculomegalia
  Quistes Periventriculares
  Anomalías de la sustancia blanca
  > riesgo de presentar alteraciones del neurodesarrollo.

Neonatology



Neonatal Umbilical Arterial Catheter Removal Is Accompanied by a Marked Decline in Phlebotomy Blood Loss

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