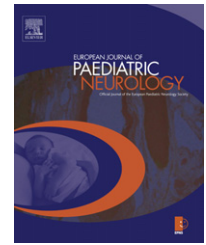




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Original article

Neurological examination of late-preterm infants at term age

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ABSTRACT

Background: Late-preterm infants represent 70% of the whole preterm population.

Aims: To establish the range and frequency distribution of neonatal neurological scores in a large cohort of low risk late-preterm infants and the possible differences with full-term infants.

Methods: Three hundred-seventy-five healthy infants born between 34 and 36 weeks gestational age (GA) without major brain lesions were assessed between 39 and 41 weeks post-menstrual age using the Hammersmith Neonatal Neurologic Assessment and compared to the scores obtained using the same examination in full-term infants.

Results: Infants born at 35 and 36 weeks GA had similar median scores in 32 of the 34 items. Infants born at 34 weeks GA had a different profile of scores compared to those born at 35 and 36 weeks, mainly in the tone items. While in infants born at 34 weeks the assessment at term age showed similar median scores to those obtained in full-term infants in 25/34 items, in those born at 35 and 36 GA the number of scores similar to full-term infants increased to 29/34. The main differences involved the tone items, with more marked flexor tone in the limbs and better head control for those born at 35 and 36 weeks.

Conclusions: This data can help as reference data when examining late-preterm infants at term age to see where the individual child stands compared to age matched low risk infants and to identify signs that are outside the reported range in infants with lesions or other risk factors.

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1. Introduction

The neurological assessment of the newborn has been widely studied in both preterm and full-term infant using the examination developed by Dubowitz and Dubowitz in 1981¹ and updated in 1998.^{2,3} The examination has been applied to large cohorts of healthy full-term newborns and low risk

preterm infants in order to establish the frequency distribution of the scores for each item in both groups.^{2–5} Data on preterm infants show that those born between 25 and 34 weeks have less flexor limb tone, poorer head control but better visual following than term-born infants.^{4,5}

No data is available for late-preterm infants, i.e. infants born at 34–36 weeks gestational age (GA), who represent the

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	1	2	3	4	5
POSTURE	arms & legs extended or very slightly flexed 	legs slightly flexed 	leg well-flexed but not adducted 	leg well flexed & adducted near abdomen 	abnormal posture: a) Opisthotonus b) Arm flexed, leg extended
ARM RECOIL	arms do not flex 	arms flex slowly, not always; not completely 	arms flex slowly; more complete 	arms flex quickly and completely 	arms difficult to extend; snap back forcefully
ARM TRACTION	arms remain straight; no resistance 	arms flex slightly or some resistance felt 	arms flex well till shoulder lifts, then straighten 	arms flex at approx 100° & maintained as shoulder lifts 	flexion of arms <100°; maintained when body lifts up
LEG RECOIL	No flexion 	incomplete or variable flexion 	complete but slow flexion 	complete fast flexion 	legs difficult to extend; snap back forcefully
LEG TRACTION	legs straight - no resistance 	legs flex slightly or some resistance felt 	legs flex well till bottom lifts up 	knee flexes remains flexed when bottom up 	flexion stays when back+bottom up
POPLITEAL ANGLE	 180	 150	 110	 90	 <90
HEAD CONTROL (1)	no attempt to raise head 	infant tries: effort better felt than seen 	raises head but drops forward or back 	raises head: remains vertical; it may wobble 	
HEAD CONTROL (2)	no attempt to raise head 	infant tries: effort better felt than seen 	raises head but drops forward or back 	raises head: remains vertical; it may wobble 	head upright or extended; cannot be passively flexed
HEAD LAG	head drops & stays back 	tries to lift head but it drops back 	able to lift head slightly 	lifts head in line with body 	head in front of body
VENTRAL SUSPENSION	back curved, head & limbs hang straight 	back curved, head, limbs slightly flexed 	back slightly curved, limbs flexed 	back straight, head in line, limbs flexed 	back straight, limbs above body

1	.5	2	.5	3	.5	4	.5	5	
0	0	1	1	54	5	36	0	3	34w
0	0	1	2	16	5	76	<1	0	35w
0	0	0	1	24	5	69	0	1	36w
0	0	0	0	6	3	90	1	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
1	0	0	1	49	13	34	1	0	34w
0	1	0	3	17	9	70	<1	0	35w
0	0	0	1	19	8	71	0	1	36w
0	0	5	2	22	3	67	1	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
3	3	24	5	54	6	5	0	0	34w
0	0	2	1	28	8	61	0	0	35w
0	0	1	1	41	5	52	0	0	36w
0	0	1	0	22	8	69	0	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
0	0	4	1	34	3	57	0	1	34w
0	0	<1	<1	30	7	62	0	0	35w
0	0	10	<1	39	0	50	1	0	36w
0	0	3	1	4	1	91	0	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
0	0	13	10	35	5	37	0	0	34w
0	0	1	1	24	1	73	0	0	35w
0	0	0	1	31	0	68	0	0	36w
0	0	0	1	12	12	72	0	3	Full term

1	.5	2	.5	3	.5	4	.5	5	
0	0	28	2	38	5	27	0	0	34w
0	0	4	1	54	4	37	0	0	35w
0	0	12	2	44	1	41	0	0	36w
0	0	5	5	19	20	51	0	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
0	0	15	2	51	9	23	0	0	34w
0	0	1	1	43	10	45	0	0	35w
0	0	5	1	42	11	41	0	0	36w
0	0	0	6	26	12	56	0	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
0	0	3	5	54	9	29	0	0	34w
0	0	4	3	44	5	44	0	0	35w
0	0	2	2	44	8	44	0	0	36w
0	0	0	4	29	15	52	0	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
4	0	17	1	49	9	19	0	1	34w
0	0	4	4	56	15	21	0	0	35w
0	0	13	3	52	5	27	0	0	36w
0	0	9	4	44	12	31	0	0	Full term

1	.5	2	.5	3	.5	4	.5	5	
3	0	19	4	47	10	16	0	1	34w
0	0	4	6	47	24	19	0	0	35w
0	0	5	3	63	7	22	0	0	36w
0	0	4	5	47	16	28	0	0	Full term

Fig. 1 – Tone and posture items. The diagram of each item shows the range of scores in the 3 subgroups of late-preterm infants examined at term subdivided according to their gestational age and those of full-term infants examined in the first 48 h after birth, previously published.³ The shading highlights the raw scores that were found in 90% of each group of preterm and term infants. The cell with highlighted border indicates the median scores.

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