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Low risk vaginally born preterm infants: A four year psychological and neurodevelopmental follow-up study

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1 Introduction

Modern perinatal care has changed the standards for preterm infant viability, morbidity and mortality developed some ten or even five years ago. Previous studies tend to focus mainly on either neurological or psychological aspects alone [10, 12, 13]. Recent studies comparing preterm infants at term conceptual age with term infants show low behavioral performance within the former group [8]. However, being born preterm today equals a period of ten weeks (26–36 weeks of gestation) compared to only six weeks (37–42 weeks of gestation) in infants born at term. Investigations of the preterm infant are thus more difficult to evaluate and can easily be misinterpreted. To avoid this problem the gestational age, i.e. very preterm vs. moderate preterm, must be considered [15, 18].

The aim of this prospective study has been to evaluate how conceptual age and fetal acidosis, correlate to the psychosocial and neurodevelopmental outcome in vaginally born low risk pregnancy preterm infants.

2 Material and methods

The study group is comprised of 39 preterm (> 37 gestational weeks) vaginally born infants who were born between January and December 1979. These pregnancies were all classified as low risk according to obstetrical standards, and high risk pregnancies were not included [24].

As a control group, ten infants born at term were followed in the same way, i.e. all infants, including control infants, were examined in a room adjacent to the delivery room during the first 45 minutes. Each baby was immediately cared for by a nurse and a neonatologist. Fetal scalp pH as well as acidbase data at one and twelve hours after delivery were obtained. Individual follow-up at 3, 9, 12, 24 and 48 months of age was carried out by a psychologist and a neonatologist. Of the 36 preterm survivors, two infants did not participate in the psychologic part at 9 and 24 months, but did participate at 48 months of age and one family had moved from our area.

The preterm infants were grouped according to gestational age, i.e. Group I, 29–33 gestational weeks, and Group II, 34–36 weeks of gestation. All complications during treatment in the neonatal ward occurred in Group I: one sepsis, one cerebral hemorrhage, one bronchopulmonary dysplasia and four patients with repeated apneas of immaturity.

At the follow-up, a semistructured interview covering socioeconomic conditions (family structure, working conditions, educational level, economic status, smoking and drinking habits, child rearing goals, methods correlated to the psychosocial status of the infant) and developmental status was carried out by the psychologist. The mothers were divided into two groups: well educated (school years > 11 years) and less educated (school years < 11 years).

years). At nine months of age the Boel hearing and vision test, with the eyes moving towards sound, and the Catell intellectual performance and neurodevelopmental test with average range of IQ points 90–110 were carried out [3, 20]. According to the IQ points the infants were divided into three groups: Average, above average, below average. The results of the first interview at nine months were re-evaluated at two years of age. Abnormalities were categorized depending on the type of neurological impairment found, psychomotor and neurologic or a combination. Minor neurodevelopmental disorders were transient psychomotor deviations (PMD) such as, abnormal muscular tone or behavioral status. Major neurodevelopmental disorders were psychomotor retardation (PMR) after correction for conceptual age, mental retardation or neurologic handicap (NH) such as cerebral paly or other permanent neuromuscular disorder. The Denver and Milano Comparetti [9, 16] were used when assessing the developmental status. Follow-up at the Child Health Care Center was then made at four years of age with a physical examination and hearing and vision tests as well as an interview covering the social and behavioral ability of the child. Parental and institutional consent were obtained for the present study.

3 Results

The gestational age groups and the number of infants with fetal acidosis are shown in table I. In Group I, seven of thirteen infants (52%) had fetal acidosis (pH < 7.20) but in Group II there were only 3 of 23 (12%).

In table II (Group I) and in table III (Group II) data on each individual child as well as their mothers are presented. The acidbase balance in both fetal acidotic (pH < 7.20) and non-acidotic (pH > 7.20) groups had normalized within 60 minutes after birth. The five minute Apgar score was ≥ 7 in all the infants. During the first week, two preterm Group I infants died: one after eight days from necrotizing enterocolitis with an accompanying intracranial bleeding, and the other child, who died suddenly and unexpectedly at home aged 198 days, had had a stormy neonatal period because of severe respiratory distress syndrome. In Group II one infant died of respiratory distress syndrome with an accompanying intracranial bleeding after three days.

In the control group all infants started to walk between 10 and 11,5 months of age; whereas, four preterm Group II infants and one Group I infant started to walk before the age of 12 months. One Group II and three Group I infants did not start walking until 18 months of age, and all of them had psychomotor deviant behavior, either at two or four years of age. Two of the late walking Group I infants also had fetal acidosis (pH < 7.20).

The hearing and vision tests at nine months of age showed no differences between the groups (tables II, III). At four years of age, seven out of nine preterm infants admitted to the Ophthalmology Department were treated for squinting (in 2 Group I, and 2 Group II infants) and refractional problems (in 1 Group I and 2 Group II infants). Of the nine preterm infants admitted to the Otorhinalaryngology Clinic,

Table I. Surviving preterm infants of different gestational age and term control group.

	Group I n = 15	Group II n = 24	Control n = 10
Gestational age (w)	29–33	34–36	39–41
Survivors	13 (87%)	23 (96%)	10
Mean birth weight (g) (range)	1995 (1075–2260)	2367 (1510–3140)	3442 (2960–4200)
SGA	1	4	0
pH < 7.2 (fetal scalp pH)	7 (52%)	3 (12%)	0
pH ≥ 7.2 (fetal scalp pH)	6	20	10

Table II. Individual neonatal and follow-up data in Group I infants.

Group I n = 15																	
Sex	G. A. (w)	B. W. (g)	Fetal pH	60' pH	5' Apgar	Dura- tion NICU stay	Venti- lation	Diagnosis	Mother's		9 months		BOEL	Psychomotor devel	Extr. group		
									age	educa- tion	Psychol test	not corr					
F	29	1140	7.16	7.32	9	70	V	PMA	31	H	ba	a	0	e	ba	—	
F	29	1075	7.17	7.30	9	56	O	IRDS	22	L	a	aa	0	a			
F	29	1400	7.17	7.28	8	70	V	Pneumonia	24	L	ba	ba	0	ba		—	
F	30	1220	7.15	7.33	10	70	V	IRDS	25	L	ba	a	P	ba		—	
M	31	1610	7.17	—	9	28	O	PMA	33	H	a	aa	P	ba			
F	31	1710	7.23	7.28	9	49	V	PMA	24	L	ba	aa	0	a			
F*	31	1450	7.34	7.19	9	8	V	RDS	25	L	—	—	—	—			
M	32	1400	7.18	7.16	7	49	V	Pneumonia	29	L	ba	a	—	a			
M*	32	1000	7.19	7.22	8	196	V	IRDS	28	H	—	—	—	—			
F**	32	1635	7.26	7.32	10	35	O	Preterm	33	L	a	aa	0	a			
M	32	2240	7.30	7.21	9	42	V	IRDS	23	L	a	aa	0	a			
F	32	2930	7.32	7.22	9	42	O	PMA	33	L	ba	aa	0	a			
F	33	1780	7.17	7.22	10	28	O	Preterm	34	L	a	aa	0	aa		+	
F	33	2080	7.26	7.32	10	35	O	Preterm	26	L	a	e aa	0	e	ba	—	
F	33	2260	7.35	7.30	10	28	O	PMA	43	L	a	e aa	0	a			
Mean ± 1 SD										1595 ± 407		7.22 ± 0.07		7.26 ± 0.05		53 ± 43	

* Dead
** SGA

F = Female
M = Male

G.A. = Gestational age (weeks)

B.W. = Birthweight (g)

pH < 7.2 = acidotic group

IRDS = Idiopathic respiratory distress syndrome

PMA = Pulmonary maladaptation (transient tachypnoea)

RDS = Respiratory distress syndrome

H = well educated

L = less educated

V = ventilation support IPPV or CPAP

P = pathologic BOEL test

a = average i.e. normal

aa = above average

ba = below average

SIDS = sudden infant death syndrome

NEC = necrotizing enterocolitis

MBD = minimal brain dysfunction

IVH = intraventricular hemorrhage

e = extreme

e = extreme

Table II. (Continued)

2 years				4 years			
Age walking (months)	speech	Psycho-motor	Outcome			Outcome	
23	ba	ba	Cerebral palsy, speech disorder			Hereditary, myopathy, sight	
12	aa	a	Normal			Squinting	
18	a	a	Speech disorder, psychomotor deviation			Normal	
16	ba	ba	Psychomotor deviation, speech disorder			Squinting, sensorineural deafness	
12	a	a	Normal			Normal	
10	aa	ba	Normal			Normal	
-	-	-	NEC (died d 8)			-	
12	a	a	Normal			Speech disorder	
-	-	-	SIDS (died d 198)			-	
12	a	aa	Normal			Normal	
13	a	aa	Normal			Normal	
14	a	ba	Normal			Sensorineural deafness	
12	aa	aa	Normal			Normal	
18	ba	ba	Speech disorder, psychomotor deviation			Normal	
15	a	ba	Normal			Normal	

four were normal, two Group I infants had a sensorineural deafness, and four Group II infants had difficulties that needed speechdisorder support. Among term control infants no such problems were found.

The psychosocial examination made at nine months of age using the Catell test on intellectual capacity, is shown in figure 1. The test showed that the performance of four preterm infants was above average (aa), 20 infants were average (a), and nine infants scored below the average (ba). The 46.1% Group I and 14.3% Group II infants who scored below average without correction for gestational age had a normalized distribution with only 0% and 4.8% respectively below average when corrected for gestational age. The average intellectual capacity in the Catell test measured as IQ points for the preterm infants was 97 (range 64–113) and for the term control infants, 115 (range 99–123). When corrected for conceptual age, the preterm infants with an average IQ of 114 (range 70–133 points) did not differ from the term infants.

Less educated mothers were found in 74.4% of the preterm group in contrast to 50.0% in the term control group. Two well educated and five less educated mothers had infants who, at four years of age, showed psychomotor deviations. The mother of one child with a neurologic handicap belonged to the less educated group. The well educated mothers were older, and they had also married later than the less educated mothers. One mother in the preterm group was unmarried. As confirmed at subsequent interviews, the families' socioeconomic structure and interpersonal relations were stable. Over the period studied, the parents were divorced in only one preterm and in one term control family.

At the first interview in the neonatal ward, questions were adapted for the estimation of attitudes on having a preterm child. This revealed that having a preterm baby and with the child being separated from its mother, there was a more stressful experience for primigravidae mothers (12 preterm and 7 term); however, this was considered a minor problem, lasting only

Table III. Individual neonatal and follow-up data in Group II infants.

Group II n = 24															
Sex	G. A. (w)	B. W. (g)	Fetal pH	60' pH	5' Apgar	Dura- tion NICU stay	Venti- lation	Diagnosis	Mother's		Psychol test		BOEL	Psycho- motor devel	Extr. group
									age	educa- tion	not corr	corr			
F	34	2550	7.21	7.26	9	21	O	Preterm	29	L	a	e aa	O	aa	—
M	34	1400	7.22	7.33	10	21	O	Preterm	28	L	—	—	—	—	
M	34	1810	7.23	7.26	8	35	V	IRDS	22	L	a	aa	O	ba	
F	34	1320	7.24	—	10	21	O	MRD	24	L	—	—	—	a	
F	34	2240	7.27	7.30	10	28	P	PMA	30	L	a	aa	P	aa	
M	34	2300	7.32	7.14	10	28	O	PMA	27	L	a	a	P	a	
M**	35	1770	7.19	7.28	10	28	O	Preterm	30	L	—	—	—	—	
F	35	2090	7.22	7.26	10	21	O	MRD	35	H	a	aa	O	a	
F*	35	2920	7.23	7.11	5	5	V	IRDS	37	L	—	—	—	—	
F**	35	1510	7.24	7.41	42	42	O	PMA	30	L	ba	a	O	aa	
F	35	3140	7.24	7.38	10	7	O	Aspiration	28	L	a	a	O	a	
M	35	2670	7.27	7.35	10	14	O	Preterm	32	H	aa	aa	O	aa	+
F	35	2120	7.34	7.31	8	14	O	Preterm	22	L	aa	aa	O	aa	+
M	35	2740	7.34	7.30	9	21	O	Preterm	35	L	a	aa	O	a	
M	35	2300	7.37	7.26	10	14	O	PMA	30	H	a	aa	O	a	
F	36	2450	7.16	7.42	7	14	O	Preterm	26	L	a	a	O	a	
F**	36	1850	7.19	7.13	9	28	O	Preterm	29	L	a	a	—	a	
M	36	2970	7.24	7.23	9	14	O	PMA	21	L	a	aa	O	a	
F	36	2630	7.27	—	9	7	O	Preterm	36	L	a	aa	O	a	
F**	36	1920	7.30	7.27	10	35	O	PMA	30	H	ba	a	O	a	
M	36	2170	7.33	7.17	10	21	O	Preterm	29	L	aa	aa	O	a	
M	36	2490	7.37	7.16	9	35	V	PMA	29	H	e ba	e ba	P	e ba	—
F	36	2780	7.39	7.30	8	14	O	PMA	28	H	aa	aa	O	aa	+
F	36	2670	7.39	—	10	7	O	Preterm	34	L	a	aa	O	a	
Mean ± 1 SD		2367 ± 415	7.27 ± 0.07	7.27 ± 0.09		21 ± 10									

Abbreviations, see Table II.

Table III. (continued)

Age walking (months)	speech	Psycho-motor	Outcome	Outcome
9	aa	a	Normal	Normal
13	—	—	Normal	Speech disorder
12	a	ba	Normal	Normal
14	ba	a	Normal	Normal
12	a	a	Normal	Normal
10	ba	a	Psychomotor deviation	Speech dis, psychomotor deviation, MBD
—	—	—	—	—
11	a	a	Normal	Normal
—	—	—	IVH (died d 3)	—
11	ba	ba	Psychomotor deviation, speech disorder	Normal
16	a	a	Normal	Squinting
12	ba	a	Normal	Speech disorder
13	ba	a	Normal	Psychomotor deviation, enuresis, immaturity
12	a	ba	Speech disorder	Normal
16	a	aa	Normal	Normal
12	a	aa	Normal	Normal
13	—	—	Cerebral palsy	Cerebral palsy
14	a	aa	Normal	Speech disorder, enuresis, psychomotor deviation, sight
18	a	a	Normal	Psychomotor deviation, immaturity
14	a	ba	Psychomotor retardation	Normal
16	ba	ba	Psychomotor deviation	Normal
17	ba	ba	Psychomotor retardation	Psychomotor deviation, squinting
13	aa	a	Normal	Normal
14	a	aa	Normal	Speech dis, enuresis, psychomotor deviation, sight, MBD

Figure 1. Intellectual performance (IQ points) with correction for conceptual age on Catell test at 9 months of age.

for the first days, when asked again at subsequest interviews. On returning home from the neonatal ward, all but two mothers reported a normal mother to infant relationship.

The psychological assessments of infants with extremely low (–) or extremely high (+) performance, i.e. infants showing minimum and maximum combined test results as shown in tables II and III, are summarized in table IV. In both the low and the high performance groups respectively, two and three mothers had high and low levels of educational. Fetal acidosis

was present in three of five low performance infants. Two of five had normalized at four years of age.

On language performance at nine months of age (table V) the delay following prematurity, in contrast to infants born at term, was obvious. The understanding of language was good and did not differ between the two groups of infants. When speech was tested at four years of age, four Group II infants needed speech disorder help, and two Group II infants had minor speech problems with syllables as one did in the term control group.

Table IV. Extreme infants on psychological assessment.

9-month-performance	Gest. group	G. A. (w)	Fetal pH	Sex	B. W. (g)	Walking age	Late speech	Normal neuro-development at 4 years
Low	I	29	7.16	girl	1140	23	yes	no
	I	29	7.17	girl	1400	18	no	yes
	I	30	7.15	girl	1220	16	yes	no
	I	33	7.26	girl	2080	18	yes	yes
	II	36	7.37	boy	2490	17	yes	no
High	I	33	7.16	girl	1780	12	no	yes
	II	34	7.21	girl	2550	9	no	yes
	II	35	7.27	boy	2670	12	yes	yes
	II	35	7.34	girl	2120	13	yes	yes
	II	36	7.39	girl	2780	13	no	yes

Table V. Language development at 9 months, 2 and 4 years of age.

	Preterm		Term control
	Group I	Group II	
9 months	n = 13	n = 20	n = 10
Babble	3	2	0
Combine syllables	1	4	1
Understand and repeat words	7	13	1
Speaks 1–3 words	2	1	8
2 years	n = 13	n = 20	n = 10
Combines 1–2 word, poor language	3	6	0
Combines 2–4 words	7	13	7
Combines sentences > 4–5 word, good language	3	1	3
4 years	n = 13	n = 22	n = 10
Speech disorders	1	5	1
Understand and speak well	12	17	9

As shown in table VI the neurodevelopmental outcome at four years of age was normal in all term control infants. At three years of age, one preterm Group I infant was diagnosed as having a hereditary muscular disorder. At four years of age, four preterm infants had some form of neurologic handicap (3 in Group I and 1 in Group II). Unilateral otoneuropathy was found in two of the Group I infants. In six Group II infants minor psychomotor deviations (PMD) were noted. All in all 5 infants in Group I, 9 in Group II and 1 in the control group, had squinting, hearing, speech disorders, psychomotor deviations or neurologic handicaps alone, or as additional findings.

Mostly, the psychomotor developmental (PMD) problems seemed to be of minor importance, and the number changed from time to time, as seen in figure 2. The rate of PMD found in Group I and Group II infants, showed a tendency towards a normalization at two years of age. At four years of age there were no Group I infants with PMD; whereas, an increased rate of PMD was found in Group II infants. Although fetal acidosis is related to a somewhat higher risk of handicap related problems at four years of age, in the very premature births of babies in Group I (4 of 7 with fetal acidosis vs. 1 of 6 without fetal acidosis, table II) this does

Table VI. Neurodevelopmental outcome at 4 years of age.

	Sensory disorder			Neurodevelopmental disorders		
	Sight	Hearing	Speech	Minor	Major	Total
Group I n = 13	3	2	1	0	3	5/13 (38.5%)
Group II n = 22	4	0	5	6	1	9/22 (40.9%)
Control n = 10	0	0	1	0	0	1/10 (10%)
Total	7	2	7	6	4

Figure 2. Longitudinal neurodevelopmental observations in Group I (29–33 gestational weeks) and Group II (34–36 gestational weeks) preterm infants. PMD = Psychomotor deviation, PMR = Psychomotor retardation, NH = Neurological handicap (cerebral palsy or neuromuscular disorder).

not imply that infants without fetal acidosis can remain free from the risk of problems, since one of two with fetal acidosis and 8 of 20 without fetal acidosis in the only moderately preterm infants (Group II) still had problems at four years of age.

4 Discussion

Previous reports show that preterm infants on an average do less well in developmental tests, including speech disorders, and they also start to walk at a later age [1, 2, 4, 8, 19, 23]. However, with a correction of the conceptual

age, both preterm groups had a strong tendency towards normalization found in the results of their psychological tests. The value of using a corrected age has been questioned [6, 15, 17]. Perhaps a correction in some aspects balances preterm and term infants, but in others disguises behavioral problems diagnosed later as minor behavioral psychomotor deviations (PMD) [6, 23]. Further, longitudinal investigations on selected and well defined populations are needed.

Early immediate separation of mother and child has been correlated to later psychosocial problems by some investigators and rejected by others with reference to other periods in early human life to be just as important for later development [7, 13, 22]. A more intimate contact between mother and infant was postponed in our study for approximately 45 minutes. The repeated psychosocial interviews showed a well functioning mother to child contact, established within the first days in all but two months. All mothers were taking an early and active part in the day-to-day nursing care which might be as important for the imprinting of a parent-infant attachment necessary for later favorable development as the immediate contact after birth probably is [12, 15].

Recent studies show a decrease in major neurologic handicap and psychomotor retardation (PMR) in a growing number of preterm infants who survived neonatal care [6, 11, 21]. In this low risk population with neither intrapartum nor postpartum explanation for later poor psychomotor outcome, there was a tendency of normalization at two years of age in both preterm groups. At four years of age, more speech disorders and neurodevelopmental problems were found in the moderately preterm infants (Group II) in comparison to term control infants. This points to the need of psychological and neurodevelopmental follow-up, including hearing and vision tests, not only in the smallest infants, but also in moderately preterm infants. This has also been observed by HAGBERG et al. [10, 11], who observed a certain increase of cerebral palsy in later years in infants with birthweights between 2000–2500 g.

In this study the mortality rate did not differ between the two preterm low risk pregnancy groups, although an acidotic fetal scalp pH below 7.20 was found in 52% Group I infants compared to 12% Group II infants. The Apgar score at five minutes was normally in all infants. Normalization of the pH at 60 minutes of age could be indicative of the ability of modern peri- and neonatal programs to stabilize the preterm infants rapidly after birth. This is probably most important for their survival and neurodevelopmental results [12, 13].

This study shows a rise in minor (PMD) problems with a shifting longitudinal trend over the four-year study. The neurological symptoms were mild in most infants, and no infant presented signs of mental retardation at the physical and behavioral examination at four years of age. This is probably due to the effect of excluding high risk pregnancies. A continuing decrease of minor psychomotor deviations was found in Group I but not in Group II infants during the four years studied. The proportion of infants of moderate prematurity (Group II),

with some problems at four years of age, was similar in the groups with or without fetal acidosis in contrast to the very preterm infants (Group I) with a higher handicap rate after fetal acidosis [24]. Risk factors have been studied to calculate the risk of later handicap but they are very difficult to interpret [11, 14, 18]. The most reliable way to deal with infants at risk thus remains as a longitudinal individual follow-up of the preterm infant at general health centers or follow-up clinics [14].

While long term follow-up efforts at present concentrate on very preterm survivors after complicated deliveries, the moderately preterm infants should not be forgotten. Such infants with only small neurodevelopmental abnormalities may, later in childhood, benefit more from a psychological and neurodevelopmental follow-up at an age when more reliable tests for the detection of minor deviations can be performed. Consequently the children in the present study will be re-evaluated at school age with Griffith developmental test.

Summary

A prospective follow-up study of 39 vaginally born low risk preterm (< 37 weeks of gestation) and ten term control infants was carried out to estimate psychological and neurodevelopmental outcome at four years of age in relation to conceptual age and fetal acidosis at birth. The patients were divided into two groups: infants born after 29–33 weeks gestation (Group I) and those born after 34–36 weeks gestation (Group II), with or without fetal acidosis, i.e. a fetal scalp pH below or above 7.20. Acidotic infants normalized within the first hour after birth. Marked low and high performance groups

for intellectual performance and hearing and vision tests were discernable within the first two years. The language performance of preterm infants was delayed compared to infants born at term, especially in Group II infants. At four years of age, a higher number of Group II infants had psychomotor developmental problems; whereas, neurological handicaps were more frequent in Group I infants with fetal acidosis. This indicates that re-evaluation of neurodevelopmental outcome is needed at a later age, e.g. six years of age, in preterm infants after low risk deliveries.

Keywords: Longitudinal follow-up, low risk prematurity, neurodevelopmental outcome, psychological testing.

Zusammenfassung

Vaginal entbundene Frühgeborene ohne zusätzliche Risikofaktoren: psychischer und neurologischer Entwicklungsstand bei Nachuntersuchungen in einem Zeitraum von 4 Jahren

In einer prospektiven Studie wurden bei 39 vaginal entbundenen Frühgeborenen (< 37 Schwangerschaftswochen ohne zusätzliche Risikofaktoren) und 10 am Term geborenen Kontrollkindern im Alter von 4 Jahren

Nachuntersuchungen durchgeführt. Uns interessierte der psychische und neurologische Entwicklungsstand unter Berücksichtigung des Konzeptionsalters und einer fetalen Azidose zum Zeitpunkt der Geburt. Es wurden zwei Gruppen gebildet: Gruppe I umfaßte Kinder der 29.–33. Woche nach Konzeption, Gruppe II Kinder der 34.–36. Woche nach Konzeption. Eine weitere Unterteilung berücksichtigte das Auftreten einer fetalen Azidose

(pH im Skalpblut unter 7.20), wobei sich azidotische Kinder innerhalb der ersten Lebensstunde normalisiert hatten. Hinsichtlich der intellektuellen Leistung sowie nach Hör- und Sehtests konnten innerhalb der ersten beiden Lebensjahre Kinder mit extrem hohem Entwicklungsstand von solchen mit niedrigem Entwicklungsstand unterschieden werden. Das Einsetzen sprachlicher Fähigkeiten war bei Frühgeborenen, speziell aus der Gruppe II, im Vergleich zu Reifgeborenen verzögert. Im

Alter von 4 Jahren hatte eine größere Anzahl von Kindern aus der Gruppe II psychomotorische Entwicklungsstörungen, während neurologische Auffälligkeiten häufiger bei Kindern aus der Gruppe I mit fetaler Azidose gefunden wurden. Wir meinen, daß bei Frühgeborenen ohne zusätzliche Risikofaktoren eine erneute Untersuchung des neurologischen Entwicklungsstandes zu einem späteren Zeitpunkt, z. B. mit 6 Jahren, angezeigt ist.

Schlüsselwörter: Frühgeborene ohne zusätzliche Risikofaktoren, Langzeitstudien, neurologischer Entwicklungsstand, psychologischer Test.

Résumé

Enfants nés par voie basse prématurément lors de grossesse à bas risque: étude de la surveillance psychologique et du développement neurologique sur quatre ans

On a réalisé une étude prospective de la surveillance de 39 enfants nés par voie basse prématurément (< 37 semaines de gestation) lors de grossesse à bas risques et de 10 enfants contrôles nés à terme, afin d'estimer le devenir psychologique et du développement neurologique à l'âge de quatre ans en relation avec l'âge gestationnel et l'acidose fœtale à la naissance. Le matériel a été subdivisé en deux groupes: les enfants nés après 29–33 semaines (groupe I) et après 34–36 semaines (groupe II), avec ou sans acidose fœtale c'est-à-dire avec un pH fœtal au scalp au-dessous ou au-dessus de 7,20. Les enfants nés en état d'acidose sont normalisés au cours

de la première heure après la naissance. Dans les deux premières années, on a pu distinguer des groupes extrêmes à basses et hautes performances en ce qui concerne les aspects intellectuels et les tests d'audition et de vision. Le langage des enfants prématurés a été retardé en comparaison des enfants nés à terme, tout particulièrement chez les enfants du groupe II. A l'âge de quatre ans, un nombre élevé d'enfants du groupe II a des problèmes de développement psycho-moteur, tandis que ce sont les handicaps neurologiques qui sont plus fréquents chez les enfants du groupe I avec acidose fœtale. Cela indique qu'il est nécessaire de refaire une évaluation du devenir du développement neurologique à un âge plus tardif, par exemple, à l'âge de six ans, chez les enfants prématurés après des grossesses à bas risque.

Mots-clés: Prématurité à bas risque, test psychologique, développement neurologique, suivi longitudinal.

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