LETTER TO THE EDITOR

Efficacy of early oral and perioral physiotherapy on feeding autonomy in preterm infants: results of randomized controlled trials

M.S. Cori[1], P.E. Ferrara[2], P. Papacci[1], F. Serrao[1], A. Di Polito[2], A. Del Vecchio[2], I. Bastoni[2], C. Dipaola[2], U. Moscato[3], S. Codazza[2], G. Ferriero[4], G. Vento[1] and G. Ronconi[2*]

[1]Division of Neonatology, Department for the Protection of Women's Health and the Nascent Life, Child and Adolescent, University Polyclinic Foundation, Rome, Italy; [2]University Polyclinic Foundation A. Gemelli IRCCS, Rome, Italy; [3]Section of Hygiene, Institute of Public Health, Università Cattolica del Sacro Cuore, Rome, Italy; [4]PRM Unit, Tradate Institute, Istituti Clinici Scientifici Maugeri IRCCS, Tradate, Varese, Italy

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To the Editor,

Preterm infants can obtain oral feeding late; it is estimated that around 30–40% of them may have oral feeding problems (1) and it is an important outcome for the timing of discharge from the hospital (2). Several treatments have been proposed to facilitate the achieving of Full Oral Feeding (FOF) and reduce hospitalization times.

A blind, randomized clinical trial (Trial registration: UMIN000026533) was performed in the Neonatal Intensive Care Unit (NICU) of University Polyclinic Foundation A. Gemelli IRCCS, Rome, Italy, from January 2016 to July 2017. Primary outcome was timing to reach full oral feeding (FOF). Secondary outcomes were hospitalization time, gain of body weight from birth to discharge, and Preterm Oral Feeding Readiness Assessment Scale (POFRAS) (3) score assessment. The inclusion criteria were gestational age GA < 32 weeks and/or birth weight < 1500 g. Newborns that presented congenital malformations and genetic syndromes were excluded. After birth, the neonates were randomized into an experimental group (newborns undergoing the oral/perioral facilitation program; the physiotherapists performed a physiotherapy program of a codified series of oral and perioral stimulations 3 times a day for 6-7 minutes for six days/week) (4) and a control groups (usual care).

Physiotherapists and parents were aware of the group assignment, but neonatologists collecting data and the statistician were blinded. The study had no influence on the attending physician's clinical and nutritional decision nor on the infants' hospital discharge date. The criteria for discharge were reaching weight > 1600 g, resolution of the acute pathology and reaching full oral feeding without problems for at least 48 hours. Written informed consent was obtained from the parents of the newborns for their participation in the study. One hundred and five newborns were enrolled, and their characteristics are described in Table I. The groups were homogeneous at baseline. Oral feeding was attained significantly earlier in the experimental group (n. 53; GA: 28.8±2.2 weeks) than in the control group (n. 52; GA 29.5±2.0 weeks) (Table II)

Key words: preterm infant, oral feeding, early physiotherapy, outcome

[*]*Corresponding Author:*
Dr Gianpaolo Ronconi,
University Polyclinic
Foundation A. Gemelli IRCCS,
Largo A. Gemelli 8, 00168, Rome, Italy
Tel.: +39 3477123940
e-mail: gianpaolo.ronconi@policlinicogemelli.it

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DISCUSSION

Various studies suggest that oral stimulation improves in preterm infants sucking and feeding skills and shortens hospitalization, time to achieve feed autonomy, and the huge cost of preterm care. Evidence shows that preterm infants who received oral and sensory-motor intervention demonstrate more advanced nutritive sucking and suck-swallow-respiration coordination (5). Our results showed that an early structured intervention accelerated the transition from tube to FOF in preterm infants. This

Table I. *Baseline characteristics of premature infants in both groups*

Variables	Experimental Group N=53	Control Group N=52	P value
Gestational age in weeks	28.8±2.2	29.5±2.0	0.23
Birth weight in grams	1146±365	1148±368	0.89
Weight on discharge (g)	2455.5 (±754)	2456 (±744)	0.91
Male sex n (%)	23 (43.4%)	23 (44.2%)	1
Caesarean delivery n (%)	41 (77.4%)	47 (90.4%)	0.68
APGAR score 1 min	6.7 (±1.8)	6.6 (±1.7)	0.9
APGAR score 5 min	8.1 (±1.2)	8.1 (±1.1)	1

Data are expressed as mean±SD. n (%) or median

Table II. *Comparison of clinical outcomes between both groups*

Outcomes	Experimental Group	Control Group	P value
FOF (PMA)	35.4 (± 2.8)	36.7 (±3.4)	0.013*
POFRAS T0	17.6 (±4.9)	18.1 (±5.6)	0.58
POFRAS Tf	32.4 (±2.8)	31.7 (±3.1)	0.09
POFRAS T0-Tf difference	15 (±6)	13.6 (±6.1)	0.11
Weeks of assessment (wk)	7.5 (±3.9)	7.4 (±3.7)	0.97
Weight Z-Score difference	-0.9 (±1)	-0.71 (±1.3)	0.78
Total hospital days (d)	61.7 (±45.8)	62.1 (±47.1)	0.87

Data are expressed as mean±SD; FOF: full oral feeding; PMA: postmenstrual age; wk: weeks; d: day

observation corroborates several studies that tested similar methods of oral stimulation in premature babies (6-7). Compared to the other studies, in our work we considered newborns with an extremely low birth weight and the treatment was started very early, on average within the first week of life, as soon as the babies were clinically stable and not sedated for need of invasive respiratory assistance. Moreover, unlike the other experiences, in the present study, the start of treatment was independent from the beginning of enteral feeding. We did not have a significance impact in terms of weight gain and length of stay. These findings are similar to some previous studies (8-9). Instead, it is in contrast with other Authors, who reported that the oral stimulation protocol decreases length of hospital stay (7). These results may have been influenced by different factors. Usually every hospital follows its own discharge criteria that can be different from center to center. Moreover, in our study we have also included preterm infants with major morbidities. This can be a strong point of the study but can also lead to confounding factors influencing the length of hospital stay. In this regard, a multicenter trial it would be advisable. Rocha et al. (7). found a significant effect on the hospital stay but not on the weight at discharge and the weekly weight gain, respectively. Our results confirmed the validity of POFRAS in very low birth weight infants and in infants with major morbidities. An early oral facilitation program accelerates the achievement of the FOF in preterm infants. The infant with necrotizing enterocolitis, bronchopulmonary dysplasia or severe neurological injury could benefit from the program and should be the subject of dedicated studies. The treatment did not significantly influence weight gain or time of hospital stay although to confirm this data it would be necessary to conduct further multicenter studies that have homogeneous definition of these outcomes.

REFERENCES

1. Greene Z, O'Donnell CP, Walshe M. Oral stimulation for promoting oral feeding in preterm infants. Cochrane Database Syst Rev 2016 20; 9.
2. Thakkar PA, Rohit HR, Ranjan Das R, Thakkar UP, Singh A. Effect of oral stimulation on feeding performance and weight gain in preterm neonates: a randomised controlled trial. Paediatr Int Child Health 2018; 38 (3):181-6.
3. Fujinaga CI1, de Moraes SA, Zamberlan-Amorim NE, et al Clinical validation of the Preterm Oral Feeding Readiness Assessment Scale. Rev Lat Am Enfermagem 2013; 21 Spec No: 140-5.
4. Fucile S., Milutinov M.et al. Oral sensorimotor intervention enhances breastfeeding establishment in preterm infants. Breastfeed Med 2018; 13 (7):473-8.
5. Bertoncelli N, Cuomo G, Cattani S, et al. Oral feeding competences of healthy preterm infants: a review. Int J Pediatr 2012; 2012:896257.
6. Fucile S, Gisel EG, Lau C. Effect of an oral stimulation program on sucking skill maturation of preterm infants. Dev Med Child Neurol 2005; 47 (3):158-62.
7. Rocha AD, Moreira ME, Pimenta HP, Ramos JR, Lucena SL. A randomized study of the efficacy of sensory-motor-oral stimulation and non-nutritive sucking in very low birthweight infant. Early Hum Dev 2007; 83(6):385-8.
8. Bache M, Pizon E, Jacobs J, Vaillant M, Lecomte A. Effects of pre-feeding oral stimulation on oral feeding in preterm infants: a randomized clinical trial. Early Hum Dev 2014; 90(3):125-9.
9. Zhang Y, Lyu T, Hu X,et al. Effect of nonnutritive sucking and oral stimulation on feeding performance in preterm infants: a randomized controlled trial. Pediatr Crit Care Med 2014; 15(7):608-14.