J.P. Janssens*, J.C. Pache[+], L.P. Nicod[#].
*Dept of Geriatrics, [+]Division of Pathology and [#]Division of Lung Diseases, Geneva University Hospital, Route de Mon-Idée, 1226, Thônex, Geneva, Switzerland. Fax: 41 223056115

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Postural drainage techniques and gastro-oesophageal refkux in infants with cystic fibrosis

To the Editor:

Recently PHILLIPS *et al.* [1] added to the body of knowledge relating to gastro-oesophageal reflux (GOR) in cystic fibrosis (CF). I noted with interest the high incidence of GOR (73%) found in their study of 11 children with CF of <2.5 yrs. This reinforces the sentiment that GOR is an important issue that needs to be considered in the management of young children with CF.

In their article, PHILLIPS *et al.* [1] state that "holding the baby: head downwards positioning for physiotherapy does not cause gastro-oesophageal reflux". This is different to the findings of three independent studies on this topic over the past fifteen years [2–4]. I would like to comment on some of the significant differences between the studies that may have contributed to their different results and conclusions.

We studied 20 infants of <5.6 months newly diagnosed with CF. Eighteen of the infants were <3 months, 15 of those were ≤2 months; the other two were 4.4 and 5.6 months [4]. This large group of very young infants with CF is different to the group of 11 infants and toddlers with CF aged up to 27 months of PHILLIPS *et al.* [1].

They chose six positions, of which two positions were 20° head down lying on the left and right side and two positions were 15° head down lying on the left and right side, both with a quarter turn towards supine (the other two positions were horizontal and head up). We studied four positions: supine horizontal, prone with 30 head-down tilt and lying on the left and right side with 30° head-down tilt. We studied those four studied those four positions as they were what we were using and teaching the parents of infants with CF at our clinic.

I noted with interest that the widely prescribed prone with head down tilted position [5] was not included in the study of PHILLIPS *et al.* [1]. FOSTER *et al.* [2] found a mean oesophageal pH of 2.8 during chest physiotherapy in the prone position in their study of ten children with CF. The prone position was associated with the lowest mean pH of the four standard positions that they studied.

In considering the title of the study of PHILLIPS *et al.* [1], I was puzled by their acknowledgement that "in some infants it is possible that the head-down tipped positions may worsen GOR. Therefore, individual evaluation of physiotherapy is recommended for infants undergoing lower oesophageal pH monitoring in whom clearance of excess secretions is indicated". Does this suggest that some of the 11 patients with CF may have had episodes of GOR during chest physiotherapy?

What the study of PHILLIPS *et al.* [1] may imply is that, first, by excluding the prone head-down tilted position and reducing the angle of head-down tilt, the likelihood of increasing episodes of reflux is reduced. Secondly, the older the infant with CF, the lower the likelihood of increased episodes of GOR during chest physiotherapy. Whether the prone position should be used for infants with CF, by how much we need to decrease the angle of head-down tilt and at what age in infancy and early childhood GOR during chest physiotherapy becomes less of an issue is open to debate and further research.

Newborn screening has resulted in the commencement of daily chest physiotherapy in very young infants (often ~6–8 weeks of age) at many centres. There is substantial evidence that there is a high incidence of gastro-oesophageal reflux in infants with cystic fibrosis. I, therefore, believe that when prescribing a chest physiotherapy regimen for infants with cystic fibrosis, the unique infant differences compared to older patients should be considered, and further longer-term research should be undertaken. The main objective is to provide chest physiotherapy for infants with cystic fibrosis that is optimally effective in terms of promoting clearance of pulmonary secretions and that does not have iatrogenic effects. In the words of ORENSTEIN [6] "Respiratory disease may also provoke reflux more indirectly by prompting the use of therapies that provoke reflux. These therapies include . . . postural drainage.

B.M. Button
Physiotherapy Dept, The Alfred Hospital, P.O. Box 315, Prahran, Victoria 181, Australia. Fax: 61 393491289.

From the authors:

We thank B.M. Button for showing interest in our study. There are a number of reasons for the discrepancies between our own [1] and previous studies [2–4]. In their abstract, FOSTER *et al.* [2] conclude that chest physical therapy may precipitate gastro-oesophageal reflux (GOR), but they do not state whether the subjects were tipped; one position described is "upright". VANDENPLAS *et al.* [3] investigated physiotherapy using head-downwards positioning; however, each treatment lasted 30 min and included the intermittent use of abdominal thrusts and tracheal rubs to stimulate coughing. It is documented that the control subjects also suffered regurgitation and vomiting during "physiotherapy". BUTTON *et al.* [4] compared a "standard" physiotherapy regimen (SPT) using tipped-down positions with a "modified" regimen (MPT) excluding all tipped postures. They concluded GOR was increased in the SPT but not with the MPT, but, as TAYLOR and THRELFALL [7]

pointed out, there was no significance difference in reflux indices between the regimens, and, in the head-downwards positions, acid refluxate was cleared faster.

In clinical practice, we assess each infant to determine which segments of the lungs need clearing before treating. We ensure, however, that, during the course of a day, all lobes are treated and thus, in our study design, we included the lingula and middle lobes, which other studies have not. The lateral segments of the lower lobes were treated; prone head tilted down was not indicated. Regarding the exact angle of head-downwards tip in this age group, physiotherapy is most frequently performed by parents/carers with the infant on a pillow on the knees. The legs of the adult carer are positioned to allow different tipped positions. No previous study describes how the angle of tip was attained or indeed how it was precisely maintained. Nor, in clinical practice, is it likely to be measured by busy mothers in a home setting.

As with other studies, our own contains relatively small numbers of children. In the group we studied, there was no evidence that the head-down tipped position induced gastro-oesophageal reflux in any infant. However, neither we nor anyone else can exclude the possibility that there may be individuals who were not in the study in whom this is not the case. Our study does not "imply" anything; we concluded that, in patients of this age, using standard techniques for chest physiotherapy, head-down tilt does not cause gastro-oesophageal reflux; indeed, it is in the sitting postural drainage position that gastro-oesophageal is most likely. These postural changes are compatible with physiological understanding. We agree that extrapolation outside the specific conditions and subjects of any study should be performed with caution, and certainly what is needed is high quality research-based evidence with proper statistical analysis, rather than mere "beliefs" and "words".

G.E. Phillips, S.E. Pike, M. Rosenthal, A. Bush
Dept of Paediatric Respiratory Medicine, Royal Brompton and Harefield Hospital Trust, Sydney Street, London SW3 6NP, UK. Fax: 44 2073518763.

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