

## 138 DIGITAL SUBTRACTION ANGIOGRAPHY IN SEVERE SEQUELAE OF VIRAL PNEUMONIA

D. Pariente, J. de Blic, P. Scheinmann, D. Lallemand  
Depts of Pediatric Radiology and Pediatrics, Univ. Paris V;  
Hopital des Enfants-Malades, Paris, France.

16 children presenting with severe viral pneumonia sequelae (VPS) were explored with digital subtraction angiography (DSA) in the last 3 years. The clinical patterns were severe recurrent episodes of wheezing, significant dyspnea on exertion and/or productive cough. In all patients the initial episode of viral infection could be recognized. The age range was 18 months to 17 years and only the 3 younger patients were sedated for the procedure. The contrast medium injection was performed peripherally via a large vein. No complication was observed except one mild episode of wheezing after contrast injection. In all cases DSA showed perfusion defects which were peripheral. These anomalies were multiple in 14 cases, bilateral in 10 and unilateral in 4. In only 2 cases the defect was localized in one lobe. The proximal pulmonary arteries were always well seen, and of smaller size in the more affected lung in 5 cases. Correlations with isotopic studies were consistent, but DSA gave more information by demonstrating pulmonary vessels. Thus DSA, that is non aggressive procedure, seems to be very valuable in the investigation of VPS. DSA displays an angiographic pattern that is strongly suggestive of this diagnosis. Moreover it has a pronostic value as it precises very accurately the extension of parenchymal lesions.

## 139 TRACHEAL DIAMETERS AND DYNAMICS IN INFANTS AND CHILDREN MEASURED BY CINE-CT

C.J.L. Newth, R.G. Brasch, R.G. Gould, C.A. Gooding, M.J. Lipton  
(Introduced by M.M. Grumbach, M.D.), Depts. of Pediatrics  
and Radiology, University of California, San Francisco, CA, USA  
Nine children were evaluated for tracheal obstruction by having their intra- and extra-thoracic tracheal diameters measured using Cine-CT. The patients ranged in age from one month to four years, and had clinical signs and symptoms of respiratory distress with stridor. They entered a protocol in which there was full clinical evaluation, and in some, measurement of esophageal pressures and tidal breathing flow-volume loops. The patients were scanned without sedation using a Cine-CT scanner (Imatron, Inc., CA) which provided eight level image acquisition in 240 msec without moving the patients. Using the scanner in the "Cine" mode, 13 to 20 slices obtained over 1 to 2 respiratory cycles were obtained at several levels of both the intra- and extra-thoracic trachea to detail dynamic changes in airway caliber. Images were obtained at relatively low dose and were reconstructed in 14 seconds. Cross-sectional areas of the trachea were obtained by planimetry, and sagittal and coronal tracheal diameters directly measured. The clinical and laboratory data correlated well with the imaging measurements, and were compared with Age-related normal Cine-CT tracheal diameters, and published post-mortem airway caliber data. We conclude that Cine-CT is a rapid method for tomographic evaluation of tracheal dynamics that can be employed for children without sedation.

## 141 THEOPHYLLINE MONITORING BY MEANS OF LACRIMAL FLUID CONCENTRATION MEASUREMENTS IN CHILDREN WITH BRONCHIAL ASTHMA

J. Bauer, H. Lindemann, G. Hüls, H.J. Schwandt  
Children's Hospital, Justus-Liebig-University, Giessen

This study was performed to evaluate the suitability of monitoring theophylline concentrations in the lacrimal fluid for therapy control in asthmatic children.

Samples of plasma and lacrimal fluid of 38 children (5 - 16yrs) were collected simultaneously and measured by means of high-performance liquid chromatography. Lacrimal fluid was collected using a small strip of filter paper placed into the conjunctival sac of the lower eyelid.

Comparison of theophylline concentrations in plasma and lacrimal samples showed a significant difference. Analysis of the data, however, revealed a close linear correlation ( $r = 0,83$ ) between theophylline concentrations of the two fluids. The intercept of the regression line is very small ( $y = 0,55x + 0,26$ ). The mean plasma/lacrimal fluid ratio was  $1,79 (\pm 0,40)$ .

It is concluded, that monitoring theophylline concentrations by means of lacrimal fluid analysis is a valuable tool for therapy control.

## 142 THEOPHYLLINE CONCENTRATION MEASUREMENTS IN SERUM OR SALIVA FOR THERAPY MONITORING IN BRONCHIAL ASTHMA.

W. Leupold, K. Feller, E. Paditz, K. Richter  
(Introduced by H. von der Hardt). Depts. Paed. and Clin. Pharmacology, Medical Academy Dresden, GDR

Theophylline concentrations in serum and in saliva obtained without and with stimulation (dil. citric acid) of 20 patients in the age range of 5-19 years on a long term theophylline therapy were simultaneously assessed within 6 hours after drug intake; at the same time several parameters of the lung function were taken. The theophylline concentration measurements were performed gas-chromatographically. The saliva concentrations obtained without stimulation very strongly correlated with the serum concentrations ( $r=0,98$ ; mean deviation from the regression line  $0,70 \mu\text{g/ml}$ ). The saliva concentrations obtained with stimulation revealed a significantly weaker correlation with the serum concentrations ( $r=0,82$ ). A dependence of the concentrations from the salivation rate (ml/2 minutes) could be identified ( $r=0,66$ ) in the saliva obtained with as well as in that obtained without stimulation; this dependence exists both intra- and inter-individually. Reliability and evidence of the saliva concentrations obtained without stimulation can be further increased by measurement of the secreted saliva volume per period of time.

## EPRS—Abstracts for Poster Presentations

### 140 SLOW RELEASE THEOPHYLLINE IN PRE-SCHOOL ASTHMA: Loftus BG, Price JF, Dept. of Child Health, King's College Hospital, London, SE5 9RS.

Slow release theophylline is widely used in the management of childhood asthma. Although dosage schedules have been recommended, few studies have assessed the drug in pre-school age group. Over a 9 month period, 49 pre-school children with chronic asthma (age range 1 year 6 months - 5 years 9 months) were started on slow release theophylline using a recommended regime. Mean initial dosage was  $18.1 \pm 2.3 \text{ mg/kg.day}$  in 2 doses. Blood levels ranged from 3-21 mg/lit (mean  $\pm$  SD  $9.1 \pm 4.1$ ). The dosage was increased in 23 children because of sub-therapeutic blood levels. 8 patients were non-compliant - 4 denied non-compliance and 4 patients refused to take the preparation. 16 stopped therapy because of side effects. 6 had behavioural problems, 9 vomiting and 1 nightmares. Symptoms resolved when drug was withdrawn. 13 had satisfactory control of asthma. 12 were deemed treatment failures because of persisting symptoms, hospitalisation or repeated courses of steroids. Outcome might have been improved by a more gradual introduction of therapy and by use of an eight-hourly dosage schedule, but the data indicates that theophylline usage in this age group needs to be critically re-evaluated.

### 143 NEBULISED SALBUTAMOL IN ACUTE ASTHMA - EFFECT ON OXYGENATION. Loftus BG, Price JF, Dept. of Child Health, King's College Hospital, London, SE5.

The effect of oxygenation of nebulised salbutamol, given with compressed air, was studied in 18 patients (aged 18 months to 9 years) with acute asthma. A Radiometer TCM2 transcutaneous oxygen monitor was used, preliminary studied having shown that this accurately reflects trends in arterial oxygen tension. Heart and respiratory rates were measured at 10 minute intervals and transcutaneous oxygen ( $\text{TcO}_2$ ) continuously. Values of  $\text{TcO}_2$  were averaged over 10 minute periods. Given when baseline  $\text{TcO}_2$  was stable, nebulised salbutamol was associated with a rise of  $\text{TcO}_2$  in 9 children (range 1.1 - 13.3 mmHg, mean 5.2) and a fall in 4 (range 1.1 - 7.3 mmHg, mean 4.7) at 10-20 minutes after nebulised therapy. 5 children fell asleep during or shortly after treatment, and all of these showed a fall in  $\text{TcO}_2$  (Range 5.4 - 19, mean 9.8) with the onset of sleep. Heart rate increased in all, this effect being maximal immediately after nebulisation. The changes in  $\text{TcO}_2$  were not predictable on the basis of age, initial  $\text{TcO}_2$ , heart or respiratory rate, though children who fell asleep tended to have higher initial pulse and respiratory rates. These results emphasise the need for caution in the use of home nebulised therapy in acute asthma.