

for one sampling method (sampled on 50–60 minutes after injection).

245 children between 1 days and 16 years old were studied using our new method. Many of these were suffered from renal distress or other diseases influenced to renal function.

14 children between 3 days and 10 years old

who seemed in normal renal function were evaluated for standard renal blood flow.

As a result, the volume of renal blood flow is increased in parallel with the age, but the value of the renal blood flow per body weight are ranged about 15 ml/min. in children over 1 months old and below 10 ml/min. in new born infants.

### **Evaluation of Partial Renogram with $^{99m}\text{Tc}$ -DTPA in the Clinical Findings**

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The renoscintigram and renogram with  $^{99m}\text{Tc}$ -DTPA have been widely used. The renogram was, however, unsuccessful in some cases in relation to the clinical findings.

We have obtained the partial renogram from cortical and pelvic parts of the kidney. These parts designate the following areas, respectively; the cortical part is 1/3 outside and 1/2 length of long axis of the kidney, the pelvic part is 1/3 inside and 1/2 length of long axis. This method is easy using digital switch. The partial renogram was obtained from just after injection of  $^{99m}\text{Tc}$ -DTPA into the cubital vein for following 20 minutes with the time frame of 20 seconds.

We have experienced 18 normal cases from 3 to 15 years of age. The normal pattern of the partial renogram was nearly the same on the total renogram. In the cortical renogram, time required for reaching the left peak was 2' 28" and

the right peak was 2' 31", after that time, and the curves gradually decreased with a gently down slope. In the pelvic renogram, the left peak time was 3' 48" and the right peak was 4' 43", later than the cortical renogram and then the curves gradually decreased with a gentle down slope and up slope more gradual than that of the cortical renogram. In the total renogram, the left peak time was 3' 06" and the right peak was 3' 18".

Next, we show a left small kidney in the case of 7 year old male. Left total renogram was with flat curve and lower peak was 8 minutes. The assessment of the findings is difficult, but the cortical renogram showed normal pattern.

We think that the partial renogram was useful in the investigation of the clinical findings and the grasp of the clinical situation.

### **Ventilation to Perfusion Relationship with Xenon-133 Regional Lung Function**

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Pulmonary disease as well as heart disease alters regional ventilation and blood flow distribution without producing changes demonstrable by ordinary measurements of total pulmonary function. Radiographic methods for evaluation of regional lung disease may depict anatomic abnormalities but do not quantitate the degree of physiologic alteration. Blood gas determinations

and ventilatory function studies measure total lung function but provide no localization of regional derangements. Especially in infant there are some technical difficulties.

This study describes data obtained from 12 patients (Massive aspiration syndrome, aspiration pneumonia, lung cyst, lung sequestration, bacterial pneumonia, lobar emphysema, bronchial asthma).

Regional measurements were made, using both Xenon-133 saline injection and Xenon-133 gas inhalation. Ventilation study was performed with our original circuit system. The detector used was Phogamma Hp type scintillation camera. All data were recorded Video Tape Play-back system CDS 4096 and obtained time activity histogram at 1 sec. intervals. In quantification of ventilation to perfusion relationship, ventilation to perfusion ratio

were obtained in each 4 lung fields. Except a patient of aspiration pneumonia there was no definite unequal distribution. In aspiration pneumonia ventilatory scintigram showed no radioactivity in left lung and perfusion study revealed delayed and decreased blood flow. Ventilation to perfusion ratio was zero. Radiographic finding is only overinflation in left lung.