Nephrology, dialysis and transplantation in Shanghai, 1999

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Shanghai is the largest city in China and one of the biggest and most densely populated cities in the world. In recent years, great progress has been made in the field of medicine in Shanghai. As a new branch of clinical medicine, nephrology has also had a rapid development.

In 1999, under the auspices of the Shanghai Nephrology Association, which is part of the Chinese Medical Society, a full survey of the current state of nephrology, dialysis and transplantation was conducted in Shanghai. The results at the end of May 1999 are as follows.

Renal divisions, nephrologists and activities in Shanghai

Departments of Nephrology

The Shanghai Nephrology Association was created in 1981. As a branch of the Chinese Medical Association, it has contributed to academic, educational and research activities in the field of nephrology. Since 1981, the number of nephrology departments and nephrologists in Shanghai hospitals has grown rapidly. Since the end of 1998, 34 hospitals in Shanghai have independent nephrology departments and another 22 have renal units belonging to the Department of Internal Medicine. Among them, 15 are affiliated to the five medical schools of the city, 15 belong to other large hospitals, 11 to companies, six to the army, four to paediatric hospitals and five to traditional medicine hospitals. Overall, there are 1240 beds and 1768 patients are hospitalized each month. In addition, outpatient clinics see 16300 patients per day.

Renal biopsies are performed in 26 hospitals, six of which have renal pathology units that are able to carry out light-microscopy, immunofluorescence and electron-microscopy examinations. They also accept kidney biopsy specimens from other hospitals. Approximately 109 renal biopsies are performed every week in Shanghai.

There is one Research Institute of Nephrology in Shanghai and 15 hospitals have renal laboratories working in the fields of molecular biology, cell biology, genetics and immunology. Ten hospitals are equipped to perform renal transplantation. In 1998, 330 patients underwent renal transplantation.

Fifty-nine hospitals have dialysis facilities. In addition to haemodialysis (HD) and peritoneal dialysis (PD), the major dialysis centres are also able to perform haemofiltration (HF), haemodiafiltration (HDF), haemoperfusion (HP), plasma exchange (PE), Continuous arteriovenous haemofiltration (CAVH), Continuous venovenous haemofiltration (CVVH) and Continuous venovenous haemodialysis (CVVHD). Immunoabsorption has already started in some hospitals.

Nephrologists

There are 385 nephrologists and technicians in Shanghai (356 nephrologists and 29 technicians).

The nephrologists include: 48 professors (13.5%), 64 associate professors (17.9%), 144 attending physicians (40%) and 100 residents (28.1%). Twenty-eight nephrologists have been trained for at least 1 year in renal divisions in developed countries: 11 in the USA, seven in France, one in the UK, four in Japan, three in Australia, one in Belgium and one in Germany.

The age distribution of the nephrologists is as follows: <30 years, 82 (23%); 31–40 years, 128 (36%); 41–50 years, 78 (21.9%); 51–60 years, 48 (13.5%); >61 years, 20 (5.6%).

Academic activities

There are three nephrology journals in China, namely, the Chinese Journal of Nephrology, Nephrology, Dialysis Transplantation and the Journal of Clinical Nephrology. In Shanghai, Shanghai Medicine is a comprehensive medical journal which has a renal column. Each year, between 120 and 150 articles from Shanghai hospitals are published in Chinese journals and between 30 and 50 articles are published in international journals. Each year, between 50 and 60 nephrologists attend international meetings and approximately 20–25 famous international nephrologists are invited to Shanghai to give lectures. The once-a-month aca-
demic activity organized by the Shanghai Nephrology Association is usually attended by approximately 100 doctors.

With such a good academic environment and frequent communication, nephrology in Shanghai is getting closer to the advanced level of developed countries.

Traditional medicine

There is one comprehensive medical school of Chinese traditional medicine, with three affiliated hospitals, performing clinical and research work in which traditional and western medicine are combined.

In addition to a knowledge of modern medicine, doctors have a unique understanding of traditional medicine, proceeding to diagnosis and treatment of patients based on an overall analysis of disease and each patient’s condition. Some Chinese herbs have been found to be beneficial in kidney diseases, e.g. *Radix et Rhizoma rhei*, *Radix astragali*, *Cordyceps*, *Radix tripterygii wifordii* and others.

Haemodialysis

Patients

There are 59 dialysis units in Shanghai. In 1998, 3237 patients were treated by HD, including 1941 men and 1296 women. Their average age was 51.5 years, with 914 (28.2%) and 345 (10.7%) being older than 60 and 70 years, respectively. Among them, 191 (5.9%) patients had acute renal failure (ARF) and 3046 (94.1%) had chronic renal failure (CRF).

Primary diseases

Among the 3046 patients with CRF, 1847 (60.6%) had chronic glomerulonephritis, 131 (4.3%) had diabetic nephropathy, 119 (3.9%) had hypertensive nephrosclerosis and 386 (12%) had unknown causes of the underlying nephropathies.

Current status of dialysis

Dialysis modality. Average dialysis frequency is, at present, 2.2 times per week (usually 2–3 times per week) with a mean duration of 4.8 h (usually 4–6 h).

Permanent vascular access. All dialysis centres use arterial–venous fistulae including arterial–venous grafts in 34.7% of patients and allografts in 12.2%.

Temporary vascular access. Of the dialysis units, 86.4% used percutaneous cannulas in the femoral vein, 46% in the internal jugular vein and 8% in the subclavian vein. The majority of centres use all three techniques.

Dialysis equipment. There are 567 dialysis machines in 59 dialysis units. Of these, 96.8% are imported (from Fresenius, Baxter, Nipro, Gambro, COBE, B. Braun, Nikkiso Companies) and 3.2% are made in China. Of the centres, 98.4% use bicarbonate-containing dialysate fluid and 1.6% use acetate-containing fluid. All units use reverse osmosis-treated water. In 73.5% of dialysis units, imported dialysers are used and 26.5% use dialysers made in China. With regard to the type of dialysate membrane used, 22.2% are made of cuprophan, 44.4% are cellulose acetate, 4.1% are haemophan, 27.6% are synthetic and 1.7% are others. In 54 units, traditional medicine dialysers are reused, on average three times per week, whereas the other 8.3% do not. By the end of 1998, 735 patients (22.7%) were HBV-positive and 654 (20.3%) HCV-positive.

Outcome of haemodialysis patients

Among 3046 HD patients with CRF, 63 (2.0%) switched to PD during 1998, 196 received renal transplantation and 260 (8.5%) died. Seven hundred and forty-three patients left dialysis units in Shanghai to continue treatment in their hometowns.

Detection and isolation of patients with hepatitis. All dialysis units check regularly for the presence of hepatitis virus infections (HBV and HCV). Among the units, 91.7% do this routinely (every 3–6 months), whereas the other 8.3% do not. By the end of 1998, 735 patients (22.7%) were HBV-positive and 654 (20.3%) HCV-positive.

Peritoneal dialysis

PD is performed in 32 hospitals in Shanghai; 30 of them also practice HD, whereas two only practice PD.

Patients

By the end of 1998, a total of 559 patients had been treated by peritoneal dialysis. Among them, 36 (6.4%) suffered from ARF and 523 (93.6%) had CRF. Three hundred and five patients were men and 254 were women. The average age was 60.2 years, with 256 (45.8%) aged over 60 years.

Primary disease

Among those with CRF, 292 (55.8%) had chronic glomerulonephritis, 55 (10.5%) had diabetic nephropathy, 34 (6.5%) had glomerular sclerosis and 28 (5.4%) had unknown causes.
Current status of peritoneal dialysis

At present, 444 patients (79.4%) undergo Continuous ambulatory peritoneal dialysis (CAPD), 27 (4.8%) Continuous cyclic peritoneal dialysis/nocturnal intermittent peritoneal dialysis (CCPD/NIPD) and 88 (15.7%) daily ambulatory peritoneal dialysis (DAPD). Four hundred and forty (78.7%) patients used ‘o’ transfer sets, 94 traditional transfer sets and 25 (4.5%) others. Four hundred and seven patients (72.8%) used Baxter dialysis solution, 115 (20.6%) a solution made in China and 37 other solutions. The average dialysis solution volume was 8 l per day. Two hundred and fifty (44.7%) patients received Epo treatment.

Incidence of peritonitis. Of the 559 PD patients, 136 (24.3%) had peritonitis episodes. Eighty (14.3%) patients had one episode, 31 (5.5%) had two and 25 (4.5%) had more than two. On average, the first onset of peritonitis occurred 7 months after the start of PD.

Incidence of hepatitis. Seventy-five (8.2%) patients were HBV-positive and 24 (4.5%) HCV-positive. Both numbers were significantly lower than those in the cohort of HD patients.

Outcome of peritoneal dialysis

Of the 559 PD patients, 46 (8.2%) switched to HD in 1998, 16 (2.9%) received renal transplantation, 38 (6.8%) returned to their hometown and 79 (14.0%) died.

By the end of 1998, the dialysis association had survival records for 381 PD patients. They were as follows: survival ≤1 year 180, (47.24%); 1–2 years, 97 (25.46%); 2–3 years, 38 (9.97%); 3–4 years, 36 (9.45%); 4–5 years, 15 (3.94%); 5–10 years, 15 (3.94%); >10 years 0.

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The major causes of death among the 75 PD patients with CRF were: heart failure in 12 (16%), cerebrovascular accidents in nine (12%) and cachexia in nine (12%) patients. The principal causes of death of the three PD patients with ARF were: pulmonary infection, heart failure, cerebral oedema and cerebral hernia.

In summary, nephrology has been a rapidly growing branch of internal medicine in the greater Shanghai area in recent years. More than 350 nephrologists have taken care of 227 acute renal failure patients requiring dialysis, 3046 chronic haemodialysis patients and 523 chronic peritoneal dialysis patients. A total of 330 patients have undergone renal transplantation. Major underlying nephropathies were glomerulonephritides and hypertensive nephrosclerosis, whereas diabetes was present in fewer than 7% of cases.