INVITED ARTICLE

NEPHROLOGY IN CHINA HISTORICAL SKETCH AND PRESENT STATUS

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China has a long cultural history. As long as 2,000 years ago, the Chinese literature recorded the clinical syndrome of edema referring to its causes, pathogenesis, diagnosis and treatment. Two classics, The Canon of Internal Medicine (Nei Jing, written in The Warring States Period 475-221 B.C.) and the Synopsis of Prescriptions of The Golden Chamber (Jin Kui Yao Lue, A.D.219), both discribe edema in details, emphasizing regulation of bodily functions according to the conditions of different patients and their relations to medicine. The principles cited in these classics have been used extensively in traditional Chinese medicine to treat nephritis for many years.

However, modern nephrology as a branch of medicine has developed only in the second half of 20th century, particularly during the last 20 years. Before liberation of China in 1949, there were only a few doctors practising on kidney diseases. There was neither specialty, nor facilities. During the early post-liberation period, although the treatment and prevention of kidney diseases were emphasized by government, few people studied neohrology. Professor Wang Shuhsien in Beijing Medical College, the pioneer of modern nephrology in China, has led a research group to study renal diseases since 1955. They began using variations of the traditional edema treatment for edema from chronic nephritis. This initiated the efforts to combine traditional and western medicine in treating nephritis.

Professor Wang established the first research laboratory of nephrology in China and founded the immunological study of glomerular disease in this country. Many other hospitals made similar studies thereafter. In 1964, The National Symposium on Endocrinology and Nephrology organized by Chinese Medical Association was held in Guangzhou creating an unified criteria for clinical diagnosis of glomerulonephritis and pyelonephritis. This meeting promoted the development of nephrology in China. Unfortunately, "The Cultural Revolution" happened two years later interfered greatly with the newly born Chinese nephrology. Renal biopsy studies and all laboratory researches were abandoned under the influence of ultraleft ideology. Academic exchange with foreign countries during this period ground to a halt.

After the fall of the "Gang of Four" in 1976, nephrology has enlivened. In 1977, a Symposium on glomerulonephritis organized by Chinese Medical Association was held in BEI DAI HE. It summed up the experience and achievement of research in nephritis promoting this field. "The Clinical Classification of Glomerulonephritis" put forward at the Bei Dai He Forum was carried out through the whole country. In the following years, symposiums were held in Guangzhou and Nanjing separately. In Dec. 1980, in the First National Symposium on Medicine held in Guangzhou, The Chinese Society of Nephrology was founded under the Chinese Medical Association. Professor Wang Shuhsien was elected the first President of the Society. On May 27th 1982 the First National Congress of Chinese Society of Nephrology was held in Beijing. A delegation from the International Society of Nephrology attended the meeting and visited hospitals in Beijing, Nanjing, Shanghai and Guangzhou.

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Chinese nephrology has developed rapidly since 1977. By the end of 1982, 19 provinces set up local nephrology societies, and the members grew to 1,200 distributing through whole country. A number of nephrologists from European countries, America, Australia and Japan visited China, discussed and lectured during their stay. Most medical colleges had their own nephrology teaching and research groups. Postgraduate education and training have been initiated in some hospitals. Institutes in Beijing, Nanjing, and Guangzhou have run several advanced postgraduate courses in nephrology. The scope of research has also been extended to the field of immunopathology, pathophysiology and biochemistry in kidney diseases. Clinical dialysis and transplantation are being popularized. Many programs of laboratory research are in progress. Nephrology in China still has far to go, both in widening the scope of its service throughout the country and in raising technical levels. Basic theoretical research is still behind adequate levels. Nevertheless, the advance made in the last 20 years are the basis that permits more rapid progress.

To give a brief account of the current status of nephrology in China, we'll just mention a few of the more important and common problems.

INCIDENCES OF KIDNEY DISEASES

In 1981, a general survey of renal diseases was carried out among the residents of 13 provinces, cities and autonomous regions of China. In a population of 188,697 residents, it was found that the general incidence of renal disease was 2.25%, with the incidence of urinary tract infection (UTI) amounting to 0.91%, glomerulonephritis 0.49%, prostatitis 0.28%, urinary lithiasis 0.12%, renoptosis 0.4%, and congenital abnormalities 0.01%. There was a marked difference in the incidence of various diseases with respect to sex. UTI was found primarily in females aged from 31-40. Pyelonephritis had a predominance in females at the age of 31-50. Urinary lithiasis was far more common in males than in females, and the incidence was highest in the age group 61-70. Incidence also varies with occupation, peasants had the highest incidence 4.26%. It also showed a higher incidence in rural areas than in urban areas.

A two year study (1979-1981) of 70,692 hospitalized pediatric patients in Beijing, Shanghai and Jiangsu province reported that renal disease accounts for 4.9%. Among the renal diseases, acute glomerulonephritis accounts for 55.2%, nephrotic syndrome 18.6%, urinary infection 6.0% and purpuric nephritis 5.8%. In acute glomerulonephritis the ago of onset is 6-12 years in 74.5%. It can be seen all year round, 54.6% of which occured from September to December. Among the preliminary diseases, upper respiratory infection and tonsillitis are most commonly seen, and account for 64.7%, pyoderma comes next, accounting for 22.3%. The onset of nephrotic syndrome is at its peak in the age group of 3-4 years, the ratio of male to female patient is 4 to 1.

The incidence of uremia due to renal diseases basing on accurate nationwide statistical figures in China is not yet available. A rough estimation is that it may be as high as 3-5/10,000 population. A retrospective analysis of etiology among 944 cases of chronic renal failure made in Guangzhou showed that the chronic GN amounted to 60.1%, chronic PN 20.3%, nephrosclerosis 5.9%, polycystic kidney 3.8%, SLE 3.9%, other causes included renal TB, diabetic nephropathy, gout etc. Pediatric nephrologists in Beijing reported that acute GN is the main cause of acute renal failure in children. Among the non-surgical etiologies of acute renal failure in adult, epidemic hemorrhagic fever is an outstanding one.

As a whole the spectrum of renal diseases seen in China is not greatly different from that outside of China. Although primary glomerulonephritis is the most important disease faced by the Chinese nephrologists, lupus nephritis, diabetic nephropathy and Alport's synodrome were also commonly seen. Renal tubular diseases particularly renal tubular acidosis were frequently encountered. From 1958-1982, 46 cases of RTA were admitted to RUIJIN Hospital of Shanghai, among whom 40 cases belonged to type I, 6 cases belonged to type II, recently cases of type IV were also reported.

Investigations of toxic nephropathy due to chemical substances have been emphasized in industrial areas. Guiyang Medical College reported 30 cases of chronic mercurotoxic nephropathy among the residents living in a district of mercury mine, giving an incidence of 3.4%. The incidence rises with the increase of mercury vapor in the air and is higher in the workers over 40 years of age who have engaged for over 3 years in such a type of work as to be in constant touch with mercury vapor.

Renovascular hypertension forms an important part among the causes of secondary hypertension seen in China. During a period of 20 years between 1960 and 1979, 91 cases of renovascular hypertension were diagnosed by renoaortography in the Shanghai First Medical College, most of them were confirmed by operative findings, 60.4% were found to be due to primary arteritis of the aorta, the so called "panaortitis" (Takayasu's disease), which is a condition quite different from that generally described in the world literature. As Stuart stated that among the causes of renovascular hypertension, atherosclerosis is most commonly seen, fibromascular dysplasia ran next, while panaortitis is rarely encountered. The renovascular hypertension caused by panaortitis has a prediction for young individuals, especially the females.

GLOMERULONEPHRITIS

Since the early 1960s, efforts were made to treat chronic nephritis with combined traditional and western medicine in the hope that they might produce synergistic effects, better than either type used separately. The marked advantage of this combined method is that it greatly lessen the side effects and complications resulting from the use of corticosteroids and cytotoxic drugs. For instance, obesity, acne, and diabetes are common side effects of steroid therapy which can be ameliorated or prevented by certain Chinese tonics. Overuse of the corticosteroids may inhibit the immune response, easily leads to dangerous infectious complications. Traditional medicine that relieve "internal heat" may reduce these complications. Cytotoxic drugs often cause gastric upset and leucopenia. Traditional medicine can lessen these side effects.

Prolonged use of steroid often brings about secondary adrenal insufficiency. Workers in Shanghai have discovered that Radix Rehmanniae and Rhizoma Anemarrhenae can be used to reduce such effects. Moreover, use of tonics like Radix Aconiti Praeparata and Radix Astragali ensures that less trouble will be caused in the withdrawal of corticosteroids. For best results, traditional and western medicine are used at different stages of the disease. If the patient is week and under-nourished, immunosuppressive agents often prove of no effect and can easily lead to undesirable side effects. Under such circumstances, traditional medicine is used first to improve the patient's condition, and the immunosuppressive drugs are used afterwards. If the patient has improved after steroid therapy, traditional medicine is then employed to reduce the possibility of relapse. Many Chinese hospitals now use western medicine to induce remission, followed by traditional medicine to reinforce the curative effect. A common indication involves the common cold. Since the cold may lead to recurrence of nephritis, traditional medicine to pre-

vent cold is thus used. It is generally agreed that the use of traditional medicine in adjunct with western medicines will produce a much higher remission rate of nephrotic syndrome in comparison with the efficacy of either traditional or western medicine alone.

Since 1977, the General Hospital of Armed Forces of Nanjing has studied the effect of a medicinal herb, Tripterygium Wilfordii (TW) in treating chronic nephritis. The decoction made of its dry root and an extract from the plant were used in various types of GN, and it has proved to be effective in treating lipoid nephrosis, lupus nephritis and HSP nephritis, but ineffective in MPGN or focal and segmental sclerosis. Many of the patients who remitted during T.W. treatment had long been referred to as "steroid dependent" or "frequent relapsers" in the past. The clinical effect of T.W. is somewhat similar to steroids and can be further strengthened by the latter, but it does not posses the adverse effect of steroids. Animal experimentation also proved that T.W. can influence the course of experimental nephritis, and the combination of it with prednisone will further promote its effect. In combining tradition and western medicine, there are still many problems to be solved, but it offers us many avenues to explore and we believe the results will be of benefit to the patients.

To obtain a deeper understanding of nephritis, workers in Beijing, Shanghai, Nanjing and many other cities made a lot of experimental and clinical studies. Animal model of Masugi nephritis is widely used in China. Soluble complex disease of the Heymen type and the model of "IN SITU complex formation" were also investigated by nephrologists of Beijing Medical College. Glomerular immunopathology using either IF stain or horse-radish peroxidase labelling technique was carried out routinely in many hospitals. Using the leucocyte migration inhibition test (LMIT) with renal cortex homogenate of neonatal bovine, adult bovine glomerlar basement membrane (GBM) or tubular basement membrane (TBM) antigens, members in Institute of Clinical Medicine of Beijing Medical College found that there exists a specific cell mediated immune response to renal antigens in patients with chronic glomerulonephritis (CGN), primary nephrosis and chronic pyelonephritis (CPN). The T cells in patients with CGN and PN respond mainly to GBM antigens, and the T cells in patients with CPN to TBM antigens. It was concluded that there is a differential diagnostic value of the LMIT with GMB and TBM in differentiation between glomerular and tubular lesions.

Due to the shortage of sufficient equipment and skilled personnel to perform renal puncture biopsies for millions of nephritis patients particularly in the rural areas, non-invasive diagnostic technique for glomerular diseases are being emphasized in China. Immunologic investigation, downstream analysis and cellular biology are commonly used for diagnosis and differential diagnosis. Workers in General Hospital of Armed Forces of Nanjing advocated urinary C3 assay as a supplementary method for diagnosis of glomerulonephritis. It was said to be of value in differentiating MCNS from nephrotic syndrome due to other histopathologic type. A positive test usually militates against MCNS. It also may be used as an index in predicting results of steroid therapy in nephrosis, negative results frequently favoring a good response.

RENAL FAILURE

Kidney transplantation and hemodialysis were introduced in China in the 1960s. By the end of 1981, there were more than 1,000 cases of chronic uremic patients who have received kidney transplantation. Centers for transplantation have been built up in large cities like Beijing, Shanghai, Tientsin and Nanjing. Experience in medical management of pre and post homotransplantation of kidney has been reviewed. The two years patient and graft survival rates in Shanghai First People's Hospital were 68.42% and 47.37% respectively.

China's medical isntrument plants produce a variety of dialyzers such as Kiil type, coil type, and hollow fiber dialyzer. Kiil dialyzer is most commonly used on account of its economy of cost. Hemofiltration and sequential ultrafiltration-diffusion technique were used successfully in Zhongshan Hospital of Shanghai, Guangzhou and Nanjing. Assessment of middle molecular substances was performed to evaluate efficiency of various techniques of hemodialysis. In a variety of severe drug overdosage and poisoning, hemoperfusion was used with some success, being more efficient in the removal of certain lipid soluble or protein bound toxins. Most of the instruments used were China made.

As a developing country with a population of one billion, China for time being is still short of facilities and skilled personnel to treat the majority of uremic patients with hemodialysis and transplantation. Continuous ambulatory peritoneal dialysis (CAPD) was introduced in 1979, preliminary trial in Zhongshan Medical College on 36 cases of uremia gave gratifying results. Because of its simplicity, less expense and convenience for home dialysis, it was quickly extended to many hospital in large cities. Modified Tenckhoff catheters designed by the research group in General Hospital of Armed Forces in Nanjing and dialysate in plastic bags were manufactured locally. It is estimated that around 500 end stage renal disease patients are now maintained on CAPD. Rate of peritonitis has been decreased progressively since 1979. It averaged one case in 18.5 patient-months in Zhongshan Medical College.

Conservative methods still hold the mainstone for the treatment of many uremic patients in China. Treatment includes attempts to eliminate nitrogenous products by the alimentary canal and re-establish the water and mineral metabolism by means of traditional medicine. Workers in Ruijin Hospital of Shanghai recently reported that Radix Salviae Miltiorrhizae, an important Chinese traditional medicine having the action of promoting blood circulation to end stasis, has demonstrated a benefical effect in the treatment of chronic renal failure. It is suggested that the therapeutic action of this drug is multiple. It plays a role in adjusting the activity of fibrinosis, improving circulation, regulating the metabolic function, immune system and promoting tissue repair and regeneration. However, in advanced stages with blood creatinine level higher than 7mg/dl, no good effect has been observed. Capital Hospital in Beijing has reported the effect of intravenous supply of essential aminoacids along with low protein diet in treating patients of CRF. The uremic symptoms were alleviated with BUN and phosphate levels remarkably lower than both the pre-treatment levels and levels of low protein diet (30g/d). After the treatment, nitrogen balance was significantly improved. But it is generally of no benefit in patients of advanced uremia with persistent oliguria, coma, pericarditis, or progressive deteioration of renal function.

Pathophysiology of the chronic renal failure including the metabolism of lipids, thyroid function, immunological changes and mechanism of bleeding and coagulation were investigated by the workers in Shanghai in the aim to obtain a better understanding and to improve its management.

CONCLUSION

Chinese nephrology is a developing field. There are many things to be learnt from other countries. As China has its own culture and social system, we should develop China's own nephrology by using the best experiences of other countries combined with China's concrete conditions and her traditional medicine.