Living with renal failure

Edited by
J. L. Anderton
F. M. Parsons
D. E. Jones

Living with renal failure

Proceedings of a Multidisciplinary Symposium held at the University of Stirling, 7–8 July, 1977

Edited by

J. L. Anderton

Consultant Renal Physician, Western General Hospital, Edinburgh

F. M. Parsons

Consultant Nephrologist, General Infirmary, Leeds

D. E. Jones

Nursing Officer, Renal Unit, St. Bartholomew's and St. Leonard's Hospitals, London

MTP

Published by
MTP Press Limited
St. Leonard's House
Lancaster, England

ISBN : 0 85200 197-5

Printed in Great Britain by R. & R. Clark Limited, Edinburgh

Living with renal failure

List of Contributors

Dr J. L. ANDERTON
Consultant Physician in Renal Diseases, Nuffield Transplant Unit, Western General Hospital, Edinburgh

Mr J. BAILLIE
Director, Tullis Neill Limited, Mayfield, Dalkeith, Edinburgh

Dr J. D. BRIGGS
Consultant Physician in Renal Diseases, Western Infirmary, Glasgow

Mrs MARY BROWN
Home Dialysis Sister, Renal Transplant and Dialysis Unit, Manchester Royal Infirmary, Manchester

Professor J. S. CAMERON
Professor in Renal Medicine, Guy's Hospital, London

Dr M. CARMODY
Consultant Nephrologist, St. Mary's Hospital, Dublin

Dr W. R. CATTELL
Consultant Nephrologist, St. Bartholomew's Hospital, London

Dr T. G. FEEST
Senior Registrar, Royal Victoria Infirmary, Newcastle-upon-Tyne

Mrs JEAN K. GIBBINS
Renal Unit, Royal Infirmary, Sunderland

Mr D. N. H. HAMILTON
Lecturer in Surgery, Western Infirmary, Glasgow

Dr J. A. HENRY
Senior Registrar, Department of Medicine, University College Hospital, London

Dr D. S. JAMES
Department of Child and Family Psychiatry, Royal Hospital for Sick Children, Glasgow

Mrs DEIRDRE E. JONES
Nursing Officer, Renal Unit, St. Bartholomew's and St. Leonard's Hospitals, London

Mr A. McL. JENKINS
Senior Lecturer in Surgery, Royal Infirmary, Edinburgh

Dr J. A. KANIS
Wellcome Senior Clinical Research Fellow, Renal Unit, The Churchill Hospital, Oxford

Professor A. C. KENNEDY
University Department of Medicine, Royal Infirmary, Glasgow

Miss KIRSTY M. MARSHALL
Senior Fieldwork Teacher, Training and Development, Social Work Headquarters, Lothian Region, Edinburgh

Dr A. M. MARTIN
Consultant Physician, Renal Unit, Royal Infirmary, Sunderland

Miss KATHLEEN NICHOLSON
Nursing Officer, Renal Unit, Western Infirmary, Glasgow

Dr D. M. PARKIN
Community Physician, Leeds Area Health Authority, Leeds

Dr F. M. PARSONS
Consultant in Clinical Renal Physiology, The General Infirmary, Leeds

Dr B. H. B. ROBINSON
Consultant Physician, Department of Renal Medicine, East Birmingham Hospital, Birmingham

Professor J. S. ROBSON
Professor of Medicine, The University of Edinburgh and Director of the Medical Renal Unit at the Royal Infirmary, Edinburgh

Miss HELEN ROSENTHAL
Home Dialysis Administrator, St. Leonard's/St. Bartholomew's Regional Renal Unit, London

Dr A. W. SIEMSEN
Director, Institute of Renal Diseases, Saint Francis Hospital, Honolulu, Hawaii

Miss SALLY TABER
Nursing Officer, Professorial Unit, Addenbrookes Hospital, Cambridge

Dr T. WALMSLEY
Dept. of Psychiatry, Royal Infirmary, Edinburgh

Dr M. K. WARD
Lecturer in Medicine, University of Newcastle-upon-Tyne

Dr R. J. WINNEY
Senior Registrar, Medical Renal Unit, (University of Edinburgh), The Royal Infirmary, Edinburgh

Preface

The management of chronic renal failure by dialysis and transplantation has now become an established form of treatment in many parts of the world. However, these forms of treatment have brought with them problems in relation to the selection of patients, economics, clinical problems such as hypertension, encephalopathy, anaemia and renal bone disease, and psychological and social problems. The management of haemodialysis has changed over the years with developments in dialysers, vascular access and the duration of dialysis. Although the overall survival from renal transplantation has changed little in the past four or five years, there are hopes of improvements in relation to tissue typing and enhancement.

Perhaps the most important aspect in the management of chronic renal failure is the multi-disciplinary approach. Nursing and medical staff work closely with dialysis technicians, engineers, dietitians, local authority personnel, social workers and with the relatives of the patients.

The symposium was planned to draw together representatives from all disciplines involved in the care of patients with chronic renal failure. One of the most relevant sessions was that in which two patients with chronic renal failure described their experience.

Travenol Laboratories Limited sponsored the symposium and provided the administrative services. The contributors and editors are deeply grateful for the opportunity that this has given them to reach a wider public with a message whose importance grows daily. The editors acknowledge the helpful collaboration of our publisher and the skill of Mrs Judy Fagleston who transcribed the discussions. Finally, they wish to thank Peter Irving of Travenol Laboratories who organized the symposium and who enabled us all to respond to the challenge of "Living with Renal Failure".

JLA
FMP
DEJ

Contents

SECTION THREE

Some Clinical Problems
Chairman: J. S. Cameron

SECTION FOUR

Psychological and Personal Aspects
Chairman: M. Carmody

SECTION FIVE

Practical Management
Chairman: A. C. Kennedy

Introduction
F. M. Parsons

Two hundred years ago Cotunnius[1] associated oedema with coagulable substances in the urine. These observations were brilliantly extended by Richard Bright 50 years later[2] who, in collaboration with his chemist Dr Bostock, demonstrated a disturbance in excretion of urea associated with a full pulse, oedema, albuminous urine and contracted kidneys. One year later, in 1828, Wohler was the first to synthesize urea from inorganic radicles and wrote to Berzelius: 'I must tell you that I can prepare urea without requiring a kidney or an animal, either man or dog'[3].

In 1832 another landmark occurred. Thomas Thompson, Professor of Chemistry, University of Glasgow, who was also medically qualified, investigated the biochemical imbalance produced by malignant cholera[4], which was then endemic in the United Kingdom. Dr O'Shaughnessy[5] both extended and reported Professor Thompson's work in the *Lancet* and concluded that salts and water left the blood to enter the rice stools. Dr Latta, a clinician from Leith who probably worked in the Drummond Street Cholera Hospital, Edinburgh (situated close to the Old Royal Infirmary), logically interpreted the data of Thompson and O'Shaughnessy with amazing insight for that era and 'resolved to throw the fluid immediately into the circulation'[6] in extreme cases when the deficit could not be corrected via the gastrointestinal tract. Dr Latta recorded several examples of the beneficial use of intravenous therapy in his report to the Central Board of Health, London[6]. It would appear that he suffered the fate that many pioneers of newer forms of successful therapy encounter. In the management of one patient found *in extremis* and given intravenous fluid in her home he recorded[7]: 'A female, aged 50, very destitute, but previously in good health, was on the 13th instant, at four a.m., seized with cholera in its most violent form, and by half-past nine was reduced to a most hopeless state. The pulse was quite gone, even in the axilla, and strength so much exhausted, that I had resolved not to try the effects of the injection, conceiving the poor woman's case to be hopeless, and that the failure of the experiment might afford the prejudiced and the illiberal an opportunity to stigmatize the practice; however, I at length thought I would give her a chance, and in the presence of Drs Lewins and Craigie, and Messrs. Sibson and Paterson, I injected one hundred and twenty ounces, when like the effects of magic, instead of the pallid aspect of one whom death had sealed as his own, the vital tide was restored, and life and vivacity returned'.

Presumably Messrs Sibson and Paterson were solicitors and had been asked to attend as independent witnesses to this very new and controversial therapy. The patient made an excellent recovery and was then 'for better accommodation, carried to the hospital'. In 1832 this must have been considered a highly scientific exercise based, as it was, on an accurate assessment of the biochemical abnormality induced by cholera and exhibited all the criteria of correct fluid and electrolyte therapy as used today.

Dr Craigie, a colleague of Dr Latta, recorded the treatment of another patient[7]. 'Martha Smith, aged 38, a noted drunkard, thin and debilitated in sixth month of pregnancy, admitted into the hospital at 8 p.m., May 16th, 1832'. She was treated conventionally with 'saline' enemas but at 11.30 a.m. the findings were: 'Breathing becoming much affected; extreme restlessness; cramps severe in legs, and every symptom of sinking. Let the following saline solution be injected into one of the veins of the arm.

℞ *Muriat. sodæ* ℥i ;
Carbon. sodæ gr. x ;
Aq. calid. ℔iij, *solve temp.* 105° *Fahr.*

Noon. When about ℔i [i.e. about 450 ml] had been thrown in, the pulse was perceived to flutter at the wrist, and gradually strengthened as the injection was proceeded with. By the time ℔iiiss [i.e. about 1.5l] had been injected, the countenance, which was before quite death-like, now beamed with the appearance of health, and she began to converse freely. Pulse 96, moderate. To have ʒi gin in warm water with sugar.

Half-past one. The gin was immediately rejected'.

She required two further intravenous injections, making a total of about 4 litres in all, and then Dr Craigie reported: 'Has passed about ℔j [i.e. about 450 ml] of urine, of natural appearance; this is the first she has made since she was brought in'.

The composition of the fluid given intravenously was NaCl 45.0 mEq/l and $NaHCO_3$ 5.3 mEq/l. Thus, these accounts of the world's first intravenous fluid therapy also include the first known correction of a pre-renal failure.

In 1830 Thomas Graham (Figure 1), a Scot, was appointed to the first independent chair of chemistry at Anderson's University, Glasgow. He moved to University College, London, in 1837 and became Warden and Master Worker of the Mint in 1855[8]. Graham was one of the great scientists of the nineteenth century (see Graham's Law on the Diffusion of Gases) but to nephrologists he will be remembered for his experiments with

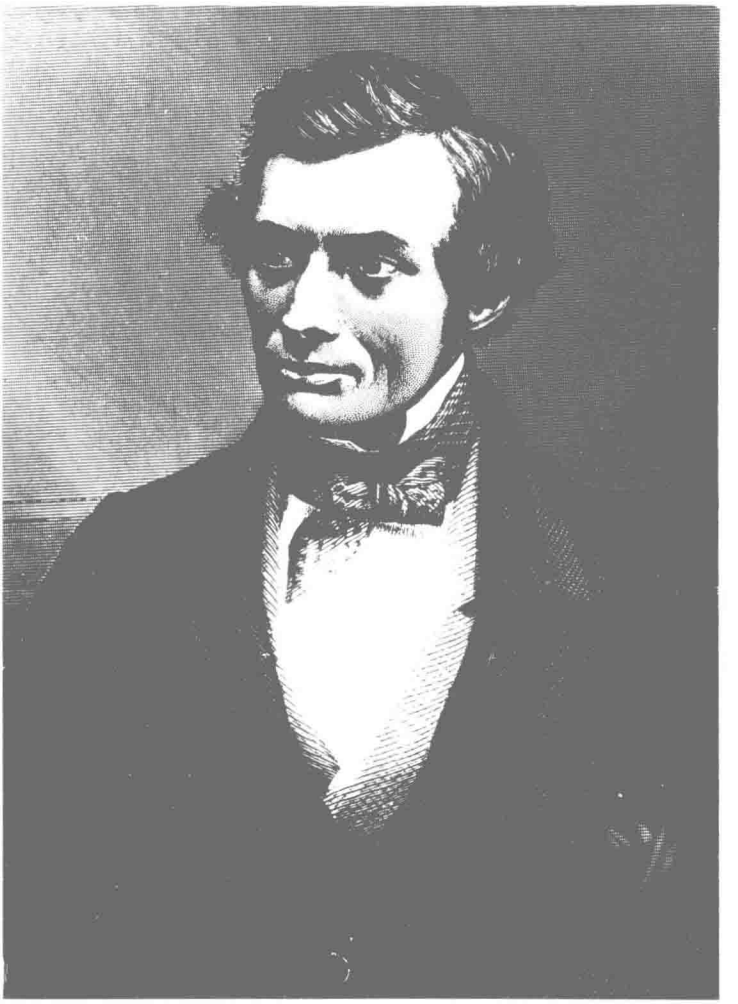

Figure 1 Thomas Graham (1805–69)

the membrane parchment (manufactured by the firm of Messrs De la Rue) which he attached to a wooden or (preferably) a guttapercha hoop (Figure 2) which was then floated on water – the 'Graham hoop dialyser'[9]. He demonstrated that when colloids and crystalloids were placed in the hoop only crystalloids passed through to enter the water. He coined the phrase 'dialysis' (from the Greek *dia*, through and *luein*, to loosen) to describe the

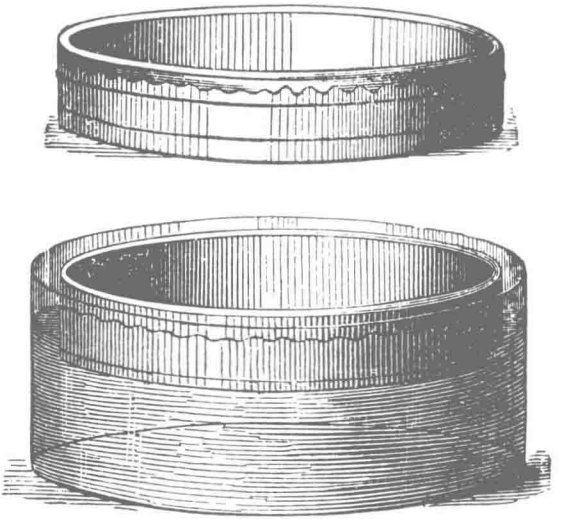

Figure 2 The Graham hoop dialyser

process. He used his 'dialyser' for much experimental work on crystalloids and colloids.

It was not until 1912 that haemodialysis was used experimentally on the dog by Abel, Rowntree and Turner[10]. This dialyser, which used celloidin as a semipermeable membrane and hirudin as an anticoagulant, was further developed by Haas in Germany[11] who was the first person to perform haemodialysis on the human. Technical problems, though, were plentiful.

In the 1940s four groups took up the challenge, each working independently. Kolff[12] must take the initial honours with the design and development of the rotating drum artificial kidney but the valuable contributions made by Alwall[13], Murray *et al.*[14] and Skeggs and Leonards[15] cannot be ignored. By the early 1950s haemodialysis was well established for the management of patients with reversible types of renal failure and in 1956 the first artificial kidney unit in the United Kingdom was opened in the General Infirmary at Leeds. Treatment then settled down to a relatively quiet peaceful routine until the development of the Scribner Shunt in 1960[16]. Overnight the scene changed, for in this single, but simple, breakthrough the long-term management of patients with irreversible types of renal failure became possible. It must be remembered, though, that it had taken over 200 years of progressive endeavour by scientists and physicians to achieve this desirable goal.

As the life of patients with terminal renal failure has now been usefully extended by intermittent dialysis new problems have inevitably emerged and many of these will be discussed during this symposium. Pre-existing disease processes have become exacerbated. New syndromes have developed whilst technical problems have been lessened or even solved. What are the inner thoughts of patients who spend many hours strapped to a machine? Is it a bearable life? Is transplantation desired by patients? What are the social and economic implications? For we are all too conscious that none could afford therapy without financial help from the community.

Speakers have been chosen to introduce these and other topics but it is hoped that everyone will join in the subsequent discussions.

ACKNOWLEDGEMENTS

Figure 1 was kindly supplied by Edith Frame, Sub-Librarian, University of Strathclyde.

Figure 2 is reproduced by permission of the Librarian of the Royal Society and the quotations are reprinted by permission of the Editor of the *Lancet*.

References

1. Robson, J. S. (1967). The nephrotic syndrome. In D. A. K. Black (ed.). *Renal Disease*, pp. 275–308. (Oxford: Blackwell Scientific Publications)
2. Bright, R. (1827). *Reports of Medical Cases*, Vol 1 (London: Longmans Green)
3. Feiser, L. F. and Feiser, M. (1961). *Advanced Organic Chemistry*, p. 3. (New York: Rheinhold Publishing Corporation)
4. Thompson, T. (1832). Chemical Analysis of the Blood of Cholera Patients. *Philosophical Magazine and Annals*, **11**, 345
5. O'Shaughnessy, W. B. (1832). Chemical pathology of cholera. *Lancet*, **ii**, 225
6. Latta, T. (1832). Documents communicated by the Central Board of Health, London, relative to the treatment of cholera by the copious injection of aqueous and saline fluids into the veins. *Lancet*, **ii**, 274
7. Craigie, T. (1832). Details of two cases of malignant cholera treated by venous injection. *Lancet*, **ii**, 277
8. Frame, E. (1970). Thomas Graham: A Centenary Account. *Trans. R. Soc. Glasgow*, 7, 116
9. Graham, T. (1861). Liquid diffusion applied to analysis. *Phil. Trans. R. Soc.*, **151**, 183
10. Abel, J. J., Rowntree, L. G. and Turner, B. B. (1913). Some constituents of the blood. *J. pharmacol. exp. ther.*, 5, 611
11. Drukker, W. (1978). Haemodialysis—A Historical Review. In W. Drukker,

F. M. Parsons and J. Maher (eds.). *Replacement of Renal Function by Dialysis*. (The Hague: Martinus Nijhoff, B. V.) (in press)

12. Kolff, W. J. (1947). *New Ways of Treating Uraemia*. (London: J. & A. Churchill)
13. Alwall, N. (1947). On the artificial kidney. I. Apparatus for dialysis of the blood *in vivo*. *Acta Med. Scand.*, **128**, 317
14. Murray, G., Delorme, E. and Thomas, N. (1947). Development of an artificial kidney. *Arch. Surg.*, 55, 505
15. Skeggs, L. T. and Leonards, J. R. (1948). Studies on an artificial kidney. I. Preliminary results with a new type of continuous dialyzer. *Science*, **108**, 212
16. Scribner, B. H., Hegstrom, R. M. and Buri, R. (1961). Treatment of chronic uremia by means of hemodialysis: a progress report. In G. Richet (ed.) *First International Congress of Nephrology*, p. 616. (Basle: S. Karger AG)