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Unknown Polish pioneers of peritoneal dialysis

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Abstract

Peritoneal dialysis is one of the methods of renal replacement therapy. The first research using a patient's peritoneal membrane for this purpose appeared at the turn of the 19th to 20th century. Among the many scientists dealing with this field of medicine during that period were also Polish representatives: Prof. Marceli Landsberg, Prof. Henryk Gnoiński and Dr. Tadeusz Szenkier. In the 1920s, independent of their foreign colleagues, they carried out and published interesting experiments on animals in Polish and foreign magazines. They indicated the possibility of using the peritoneal membrane and also the intestines, in uremia treatment. After a long period in which the development of peritoneal dialysis was restrained by the rapidly expanding development of hemodialysis, one saw its resurgent development. And here again Polish scientists made their contribution: among others, Profs. Zbylut Twardowski and Zofia Wańkowicz contributed in a significant way and are still contributing to the development of peritoneal dialysis in the world and in Poland.

Key words: *Henryk Gnoiński, Marceli Landsberg, Peritoneal dialysis, Tadeusz Szenkier*

Introduction

Peritoneal dialysis is a method of blood purification that uses the properties of the patient's peritoneal membrane. As early as 1894, a renowned English physiologist, Ernest Henry Starling, published his research on the exchange of substances through the peritoneal membrane. The following years attracted a number of investigators to the field including W. Orlow in Russia, Rudolf Klapp and Georg Ganter in Germany, Tracy Putnam in the United States and Stephen Rosenak in Hungary, who contributed to the development of this method of treatment. The group of pioneers experimenting on the possibility of peritoneal dialysis and colon cleansing for the removal of uremic toxins from patients cannot be considered as complete without mention of 3 Polish scientists – whose achievements in the field are rather insufficiently renowned and acknowledged both domestically and abroad. These are Prof. Marceli Landsberg, Prof. Henryk Gnoiński and Dr. Tadeusz Szenkier-Mazurek (1).

Marceli Landsberg, Henryk Gnoiński, Tadeusz Szenkier-Mazurek: biographies and scientific achievements

Prof. Marceli Landsberg (1890-1951) was born into a Jewish family in Tomaszów Mazowiecki, Poland (Fig. 1a). He studied medicine in Berlin and Freiburg. Between 1918 and 1926, he held the position of senior teaching assistant in the Second Department of Internal Medicine at Warsaw University, at that time headed by Prof. K. Rzętkowski. From 1934, he was head of department in the hospital in Czyste in Warsaw. During the Second World War, he initially worked as a head of department in the Jewish hospital in Lviv and then as a consultant in the hospital in the Warsaw ghetto. After the war he started his work in Łódź at the Medical Academy. He was habilitated in 1947 and went on to become the head

Fig. 1 - a, b, c) From left: Prof. Marceli Landsberg, Prof. Henryk Gnoiński and Dr. Tadeusz Szenkier-Mazurek (2).

of the Infectious Disease Department in 1950. He died in Łódź in 1951 (3-5).

Prof. Henryk Gnoiński (1891-1946) was born in Józefów, in Łódź Voivodship (Fig. 1b). He received a degree in medicine at the Jagiellonian University in Krakow. He was involved in the organization of health care in the Warsaw battalion of the Polish Legions (6). After his graduation, he moved to Warsaw, where, in 1922, he started his work at the Department of General and Experimental Pathology at Warsaw University headed by Prof. F. Venulet. In 1932, Gnoiński was habilitated in general pathology. During the war he was a sanitary head of the Peasants' Battalions (Bataliony Chłopskie). He was a pioneer of honorary blood donation in Poland. After the war, in 1946, he was appointed Professor of General Pathology at Gdańsk Medical Academy (6-10).

Dr. Tadeusz Szenkier-Mazurek, MD, PhD (1886-1963) was born into a Jewish family in Moscow (Fig. 1c). He started his medical studies in Munich, and continued them in Basel, Switzerland, where he earned a Doctor of Philosophy degree in medicine. From the beginning of his professional career he was deeply interested in urological surgery. Before the outbreak of the First World War he worked in a number of renowned urological clinics in Berlin and Moscow. In free Poland he started work in the hospital in Czyste. After the Second World War he came to Łódź where, in 1946 and 1947, he was head of the urological department in St. John's hospital, and between 1947 and 1953, he was head of the Department of Urology in the Central Clinical Hospital of the Polish Army (11).

The most prominent papers on dialysis by these doctors published in the 1920s include: first, the manuscript by Landsberg and Gnoiński titled "Recherches sur la diffusion de l'urée dans la péritoine sur le vivant" published in 1925 (12).

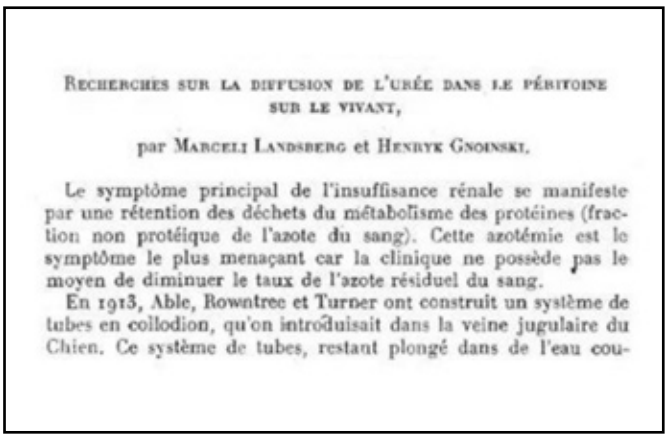
In this paper (Fig. 2), they wrote:

In our experiments on rabbits we used a living peritoneum as a natural dialyzer of high crystalloid permeability, mainly urea.… The experiment was repeated on a number of rabbits. We could observe a slight decrease in the level of urea in blood and a visibly better general condition of the rabbits with uraemia which had undergone peritoneal lavage. Having completed our tests we learned that Ganter (Wűrzburg) had achieved nearly identical results using peritoneal lavage in guinea pigs and rabbits. (12)

There are 2 pertinent selected extracts from their second publication (13):

We noticed one patient suffering from severe nephrosclerosis with intense azotemia (160 mg%) who developed exudative pleuritis where the fluid contained 164 mg% of urea. This revelation made us suspect that as long as we succeeded in inducing the swelling of the peritoneum or the pleura in a patient suffering from uraemia the fluid would absorb some of the urea and that after we had removed it the organism would be free from a great amount of that harmful excess of nitrogenous compounds.…

The patient suffering from uraemia has other ways of excreting harmful compounds, namely the large intestine.… Our research, both experimental and clinical, is aimed at making use of this third way of extrarenal excretion of



RECHERCHES SUR LA DIFFUSION DE L'URÉE DANS LE PÉRITOINE SUR LE VIVANT,

par MARCELI LANDSBERG et HENRYK GNOINSKI.

Le symptôme principal de l'insuffisance rénale se manifeste par une rétention des déchets du métabolisme des protéines (fraction non protéique de l'azote du sang). Cette azotémie est le symptôme le plus menaçant car la clinique ne possède pas le moyen de diminuer le taux de l'azote résiduel du sang.

En 1913, Able, Rowntree et Turner ont construit un système de tubes en collodion, qu'on introduisait dans la veine jugulaire du Chien. Ce système de tubes, restant plongé dans de l'eau cou-

Fig. 2 - First paragraphs of text in work by Landsberg M, Gnoiński H: "Recherches sur la diffusion de l'uree dans la peritoine sur le vivant." Comp Red Soc Biol Paris. 1925 (11).

Aus dem Krankenhause am Czyste in Warschau.

Beitrag zur experimentellen Urämie

Von

M. Landsberg und **D. Szenkier** in Warschau

Eine Folge der Ausscheidungsinsuffizienz der Nieren ist, wie bekannt, auch die verminderte Ausscheidung der Stickstoffkörper mit dem Harne, die, sich im Organismus anhäufend, endlich zu einer schweren Selbstvergiftung, der Urämie, führen. Wir meinen hier die von Volhard als „echte chronische Urämie", von Vidal als „Urémie azotémique" bezeichnete Urämieart. Im weitgrößten Teile dieser Fälle finden wir im Blut eine Ver-

Fig. 3 - First paragraph of text in work by Lansberg M, Szenkier D: "Beitrag zur experimentallen uramie." Z Chir Urol. 1930 (14).

those compounds, namely the large intestine…. (13)

It should be noted that these works were published simultaneously and independently of the pioneering research of Ganter and Putnam.

An interesting story is told by Dr. Marek Edelman, a famous Polish cardiologist and one of the leaders of the uprising in the Warsaw Ghetto during the Second World War. It concerns a visit by Willem Kolff to the Holy Spirit Hospital in Warsaw and his meeting with Marceli Landsberg just before the outbreak of the war. In the book by W. Bereś and K. Burnetko, Marek Edelman relates that:

Since Landsberg could speak all languages he could communicate with him easily. He invited Kolff to his home for dinner. Kolff went to the bathroom, where in the bathtub he saw a rabbit hanging with two tubes in the stomach. What's that rabbit hanging in your bathtub? Landsberg replied that he was carrying out an experiment. I induced uraemia in the rabbit, and now I am lavaging the peritoneum to see if the uraemia will remit. Later Willem Kolff sent him a book inscribed: "to the ideological creator of the artificial kidney…" (14)

In their last publication (Fig. 3), they wrote:

These experiments show that larger amounts of urea can be excreted from the organism owing to the large intestine cleansing…. Our, so far sparse, attempts to cleanse the large intestine methodically in the hospital, and the above mentioned experiments on animals, make us believe that this kind of surgery can be used in uraemia therapy…. (15)

Later Landsberg continued his work using the large intestine (16).

Spiritual successors in Poland

After a period of a few dozen years in which the development of peritoneal dialysis in the world was restrained by the emphasis on the expanding use of hemodialysis, since the 1980s, there has been a trend of growth as far as the number of dialyzed patients using peritoneal dialysis. In Poland a rapid development took place especially in the 1990s and at the beginning of the 21st century. Profs. Zbylut Twardowski and Zofia Wańkowicz are undoubtedly the spiritual successors of the 3 scientists and doctors mentioned above. Their research and also great experience has established peritoneal dialysis as a popular and effective method of renal replacement therapy. It is based on the knowledge and experience of a team of doctors and nurses as well as on reliable modern apparatus (17, 18).

Summary

Peritoneal dialysis is an effective and safe method of renal replacement therapy. The first attempts at using the peritoneal membrane in treating patients suffering from renal failure, date back to the end of the 19th century. In a period of over 100 years, a large group of foreign and Polish scientists contributed to its development and established it in its present position among various methods of treatment. In the initial period of research in peritoneal dialysis, rather insufficiently known professors in Poland such as Prof. Marceli Lansberg, Prof. Henryk Gnoiński and Dr. Tadeusz Szenkier dealt with research in this field.

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