

The use of Water for the treatment of Kidney Disorders



Athanasios A. Diamandopoulos

Louros Foundation for the History of Medicine, Athens, Greece

Corresponding Author: Prof. Diamandopoulos Athanasios

Medical School EKPA, Louros Foundation for the History of Medicine; tel: +00306974026198; e-mail: 1453295@gmail.com

ABSTRACT

The treatment of end stage renal failure is always based on the use of water. Both the artificial kidney machine and peritoneal dialysis use a huge amount of water, either in its pure condition (the RDT) or as the main ingredient in PD solutions. As these modalities are rather modern for an article on the history of the topic, we will skip them and proceed to the discussion of more ancient methods, correlating them with more recent times. Recent for us means from the 9th century onwards. The structure of this article was inspired by the Polka dance, originally a Czech dance and a genre of dance and music familiar throughout Europe and the Americas. It is still practiced in many countries and widely in Poland.

In this paper we present extracts from the works of Plato, Hippocrates, Aristophanes, Galen, Pliny the Elder, Paulus Aegineta, Rufus, Alexander, Avicenna with their views on mineral waters in general and their application on renal diseases. Gout and lithiasis figure prominently and were the more prominent indications for that mode of treatment. We followed the evolution of their ideas in time and compared them with the current use of hydrotherapy in various Spas with emphasis on the ones from Central and Eastern Europe.

We conclude that the popularity of hydrotherapy for treating kidney disorders was alternatively increasing and decreasing over centuries, resembling the Back and Forth steps of Polka.

KEYWORDS: Hydrotherapy, mineral waters, lithiasis, gout, Galen, Avicenna

Introduction

The treatment of end stage renal failure is always based on the use of water. Both the artificial kidney machine and peritoneal dialysis use a huge amount of water, either in its pure condition (the RDT) or as the main ingredient in PD solutions. As these modalities are rather modern for an article on the history of the topic, we will skip them and proceed to the discussion of more ancient methods, correlating them with more recent times. Recent for us means from the 9th century onwards. The structure of this article was inspired by the Polka dance, originally a Czech dance and a genre of dance and music familiar throughout Europe and the Americas. It is still practiced in many countries and widely in Poland. Thus, let us consider this structure of the lecture as a tribute to our host country. Polka can be very bouncy and upbeat. Try going Back in the Past and Going Forth in squares, and Front and again. Similarly, we will present various practices and theories about the use of baths for renal ailments back in the past, we will follow their abandonment and then will we witness going forth to their revival.

Discussion

The article starts the discussion with a general view on the therapeutic properties of baths.

Back in the past:

As the use of water treatments combines mythical, religious, medical and social characteristics, it has been a point of discussion since antiquity. We read in Plato's *Cratylus* that: "(...) and should be accepted one name only for the god (Apollo) being the god of music, or arching, oracles and of medicine (...) [as] the same tools are used by doctors and oracles like baths

and sprinkling with water, as there is a common goal: A person's soul and body purification" (1).

Going forth, the revival:

Today, ritual purification through water can be found in the religious ceremonies of Jews, Muslims, Christians, Buddhists, and Hindus. These ceremonies reflect the ancient belief in the healing and purifying properties of water. With time, various qualities of natural waters were considered, or advertised, as beneficial for health.

Back in the past:

Plutarch (1st cent. AD): "Which pain, which abstinence, which drug did solve any disease as quickly as a bath taken timely?" (2) Galen (1st/2nd cent. AD): "When there is an increase of impurities the best purgation is via phlebotomy, then baths and fasting (3) and when these are neglected many ailments appear" (4). And further on: "Who doesn't remember his (Kointos') scorn of warm and cold and dry and wet baths, now he announces names of baths without which no treatment is achieved" (5). Rufus of Ephesus (1st/2nd cent. AD) repeats the above: "(...) if the patients suffer by an abundance of bad humours, they benefit from (...) warm baths (6).

Natural springs had been classified according to their physical properties. Hippocrates had already commented that: "The next worst will be those whose springs are from rocks—for they must be hard—or from earth where there are hot waters, or iron is to be found, or copper, or silver, or gold, or sulphur, or alum, or bitumen, or soda" (7). A more detailed classification was made by Pliny the Elder (1st cent. AD) in his famous *Natural History*. He himself was a fervent advocate for bathing as his nephew Pliny the Younger states "In the country, the only time he took from his work was for his bath, and by bath I mean his actual

immersion, for while he was being rubbed down and dried he had a book read to him or dictated note" (8). Also Paulus Aegineta (7th cent. AD) elaborated on the topic (9). According to Galen, natural waters could also be classified in accordance to their temperature: *"The so-called natural springs in some places have a pleasant temperature; in others these are boiling or lukewarm, while the cold ones are everywhere"* (4).

Going forth, the revival:

Similarly, nowadays a variety of natural waters is widely advertised as good for health, as we can see from extracts of various pamphlets for spas in Central and Eastern Europe:

1. The Yeisk resort, on the coast of the Azov Sea, is famous for its healing waters containing hydrogen sulphide (...). The main therapeutic factors of the resort are the unique and rare in the content of iron, mineral waters surpassing in some characteristics all known springs in the world (10).
2. Carbonaceous: Naturally carbonated waters. Stimulate the appetite and digestion when drunk, increase the digestive secretions of the stomach, pancreas and intestines (11).
3. Sulphur-containing water reduces gastric secretion, helps digestion, and treats lazy bowels. Less mineralized waters are used for treating calculus (kidney stones) and urinary tract infections (12).

Apart of the variations of waters, baths and bathing always took place in beautiful scenic landscapes and in buildings with works of art.

Back in the past:

Romans took this to the extreme, building huge imperial bath complexes full of mosaics, statues, paintings and other luxuries. In many ways, these were similar to community centers. Because the bathing process took so long, conversation was necessary. Many Romans would use the baths as a place to invite their friends to dinner parties, and many politicians would go to the baths to convince fellow Romans to join their causes. The *thermae* had many attributes in addition to the baths. There were libraries, rooms for poetry readings, and places to buy and eat food. The modern equivalent would be a combination of a library, art gallery, mall, restaurant, gym, and spa (13). Baths were a site for important sculptures; among the well-known pieces recovered from the Baths of Caracalla are the Farnese Bull and Farnese Hercules and the larger-than-life early 3rd century patriotic figures somewhat reminiscent of Soviet Socialist realism works (now in the Museo di Capodimonte, Naples). There were also famous artistic works in the baths of Constantinople (14, 15). Later, Avicenna in his Canon of Medicine in the 10th century elaborated on: *The bath-rooms: Temperature of air in different rooms (temperate, warm, hot, and cool); mural decorations* (16).

Going forth, the revival:

The use of public baths declined during the Middle Ages, partially revived in the 16th century and reached its peak in the 19th. To limit the search only to France, we quote six novels from Philip Albou's article on "Taking waters in the French literature" (17). Namely, 1. Michel de Montaigne (1533 – 1592) who compares the particular manners of taking water in France, Germany and Italy in 16th century. 2. Gui Patin (1602 – 1672), the famous Senior of the Faculty of Medicine of Paris, declared to be very perplexed as to the effectiveness of water, going on to declare: "the waters make more cuckolds than they do cure patients!"; 3. The account of Madame de Sévigné (1626 – 1696), from her famous Letters, on taking waters in Vichy in 1676; 4. Thermal treatment (without effect...) of the extinction of voice of Nicolas Boileau (1636 – 1711) at Bourbon-l'Archambault in 1687; 5. The portrait of Irene (alias Madame de Montespan)

found in the "Caractères" of Jean de la Buyère's (1645 – 1696); and finally, 6. An extract of the novel Mont-Oriol by Guy de Maupassant where he evokes the cynical and financial aspects of the creation of a thermal place in the centre of France during the 19th century. The latter, though cynical, explains in part the frenzy of building huge hotels and other buildings in that era to accommodate the well-off's desire for cure and recreation. Focusing on the subject of this article, we notice an echo of the bath decorations of the past in the modern trend of the last two decades, as more designers and operators recognize the healing benefits of positive distractions, natural views, and daylight within their care environments (18).

Having dealt in brief as an introduction with the general ideas of the benefits of bathing both in the past and in modern times, we will focus now on our central theme that is the use of waters for kidney problems.

Back in the past:

Hippocrates (5th cent. BC): *The very cold water minimizes and eliminates the tumours and pain of gouty attacks.* (19) He also commented on the impact of the quality of drinking water on stone formation: *"Men become affected with the stone, and are seized with diseases of the kidneys, strangury, sciatica, and become ruptured, when they drink all sorts of waters, and those from great rivers into which other rivulets run, or from a lake into which many streams of all sorts flow"* (5) Galen: *For renal diseases you should consume a light diet and very frequent baths. Because drinking too much water is contraindicated in renal disease while purification via the skin is desirable* (20). Plutarch refers to the gouty attack of Sulla, the Roman general, who according to Strabo hurried himself to the medicinal waters of the Aedipos Baths, at the island of Euboea in Central Greece (21). Paul of Aegina (5th cent. AD): *"(...) for retention of urine: add a fifth part of heated oil to the water. Such a bath is highly anodyne"* (9). Alexander warns on the over-prescription of hot or cold baths for treating renal problems and suggests moderation (22). Hydrotherapy in Byzantium was a strong therapeutic agent for many ailments, including acute nephritis and attacks of gout (23). Avicenna (10th cent. AD): *"(...) On the presentations of the urinary stone. Know that when the stone enlarges in the kidney it hinders the urine, causes intolerable pain, and may lead to mental confusion from pain. Each occasion of the pain is called an episode (the pain is intermittent). During the episode of pain the patient should sit in a tub of warm water in which the leaves of cabbage..."* (24).

Generally, in antiquity methods for alleviation of pain from kidney stones consisted of (...) baths and warm clisters that were sometimes medicated (25). Hence, even the comic play writer of the 5th cent BC Aristophanes has Dionysus suffer from kidney pains, because of overtiredness, to beg Zeus to permit him to run to the public bath for relief (26).

Going forth, the revival:

In The Principles and Practice of Medicine, William Osler (1849–1919) commented on the topic: *"Many patients find benefit from a stay at Saratoga, Bedford, Poland or other mineral springs in this country, or at Vichy or Ems in Europe"* (27). In Central and Eastern Europe today, bath treatments for kidney diseases flourish. We present indicatively a few such places:

1. Czech Spas – Treatment of kidney and urinary tract diseases has a long tradition in Marienbad with the use of the god-given effects of natural carbon dioxide. The curative springs, in particular, the hypotonic mineral waters in the drinking cure, are the foundation of therapies for urologic and kidney illnesses in children, adolescents, men and women. Due to the cooperation with the dialysis centre Fresenius in Marienbad, it is possible with advance arrangements, to

treat patients requiring a dialysis program (*sic!*). A fine example of the combination between alternative and high tech treatments based on commercial goals (28).

2. The Royal Spa hotel in Mariánské Lázně specialises in kidney and urinary tract treatment. Natural mineral carbon dioxide treatment in the form of both water and dry baths helps the vascular system widen and become more flexible. Carbon dioxide, which is absorbed through the body surface, stimulates receptors of even the tiniest capillaries in our body. It is also suitable for curing cysts, kidney stones and sand (lithiasis) or kidney hypofunction in connection with other chronic diseases (29).
3. In the Carpathian Basin in Central Europe, where Hungary is located, the crust of the earth is very thin, so these waters right from the core of the earth rise to the surface very easily. There are more than 200 thermal spas (...) used to cure kidney diseases. Most Hungarian spa resorts use their hot springs complimentary to regular medicinal methods in many type of diseases and conditions like skin diseases, (...) kidney diseases, neurological problems, etc. depending on the composition of their waters. In Hungary, spa treatments are covered by the Hungarian medical insurance plan and regularly prescribed by Hungarian doctors as part of natural rehabilitation protocols (30).
4. There are more than 1300 mineral sources in Slovakia, used as curative waters for (...) renal diseases. There are 21 thermal spas built on these mineral springs, usually divided in three groups according to type: Balneological spas, Climatic spas, mixed spas. The main focus of the "cure" is often drinking water from the spring (it usually tastes like medicine), but all of the spas listed also offer soothing soaks, medicinal massages!) and other restorative therapies, as well as swimming and other recreational opportunities in beautiful natural settings (31).
5. The oldest balneological centres in Russia are the resorts of Caucasian Mineral Waters. The waters in Zheleznovodsk at Stavropol Krai can heal the digestive system, the pancreas, and kidneys (11). In the same area, the Mashuk Aqua-Therm hosts the only monument in the world commemorating enemas, unveiled in June 2008 (Figure 1) The 770-pound bronze statue stands nearly five feet tall and was created by a local regional artist named Svetlana Avakova. The use of enemas for treating uraemia has been well established since antiquity.
6. Treatment descriptions – Pühajärve Spa & Holiday Resort (...) for heart diseases, high blood pressure and kidney diseases. The discovery of the mineral springs in 1876 marked the beginning of the history of Rymanow-Zdroj. It specializes in the treatment of children with kidney diseases (32).



Figure 1 - The only monument in the world commemorating enemas, unveiled in June 2008, at the Mashuk Aqua-Therm.

The main ways in which baths are useful in treating renal failure were perspiration and toxic substance elimination via the skin, which acted as a kind of dialysis membrane.

Back in the past:

Hippocrates: "We should then abstain from the cathartic methods performed from below (that is, diuretic drugs and enemas). The best of all though is to provoke diuresis and perspiration and get the patient walking" (33).

Aristotle (4th cen. BC): "And soon this (alien substance) is separated and discharged. And the latter when is discharged from below is called urine whereas when it is eliminated through the skin is called perspiration. Both are saline for the same reason" (34).

Rufus: "because it is good for them to be able to perspire if diuresis stops. The best of all is a steam bath in a small vat with the head coming out from the top, so that, while the rest of the body is being heated, one can breathe cool air" (35).

Going forth, the revival:

A Clinical/Historical paper we wrote tried to explain the beneficial role of perspiration in renal failure: "(...) Each human kidney has approximately 1.2 million nephrons. In other words, humans have as many nephrons as sweat-glands (...). The role of the skin as an excretory organ is also demonstrated by the fact that the sweat glands as well as the kidneys have receptors for aldosterone and ADH (...). We found a difference of 16 mg/dl in average blood urea between winter and summer months (mean winter urea 182 mg/dl, mean summer urea 166 mg/dl). These differences were statistically very significant ($p < 10^{-27}$). There was no significant difference in patient body weight between winter and summer months" (36). The following articles back our thesis:

Sauna baths in the treatment of chronic renal failure.

Snyder D, Merrill JP, Trans Am Soc Artif Intern Organs. 1966; 12:188-92.

Sweating treatment for chronic renal failure.

Lacher JW, Schrier RW. Nephron. 1978;21(5):255-9. "This removal of urea, water and salt suggests that sweating could be used to treat uraemia in conjunction with charcoal hemoperfusion";

Stimulated sweating in chronic renal failure

Man in 't Veld AJ, van Maanen JH, Schicht IM. Br Med J. 1978 Jul 15;2(6131):172-3. "With hot baths and/or saunas the urea and creatinine in RDT patient falls"

Hot bath for the treatment of chronic renal failure

Ting Ye, Weiping Tu & Gaosi Xu, Ren Fail. 2014 Feb; 36 (1):126-30: "(...) Therefore, it offers an adjuvant alternative renal replacement method".

Local application of footbaths for gout has been also suggested.

Back in the past:

Rhazes (9th cen. AD) stated that: "Two factors are involved in gout management via application of water to the feet; the temperature of the water and the time of application. Some patients with gout are advised to use extremely cold water during acute episodes, while others need to apply tepid or hot water (37).

Going forth, the revival:

Claridge in the 19th cen wrote: "A king's councilor had suffered for six years with the gout (...) repeated cold foot-baths, after some days, caused the inflammation and redness to disappear (38). The method has a modern interpretation: In Foot Bath Therapy, warm water can promote blood circulation, and blood

flow after a footbath can increase to 10~18 times above normal, which can improve patient metabolism and Qi-blood circulation. Besides, Foot Bath Therapy can improve the skin functions of mucosa absorption and skin penetration, which can promote the medicine ingredients to be absorbed into the blood (39). Basically, hot therapy is applied when there is no inflammation while cold therapy where there is inflammation/swelling. Contrast Hydrotherapy (CH) has been used for treating and preventing gout besides daily hydration.

The most exotic treatment is via magnetized water. Its ancestor was mesmerism. Practitioners were often known as magnetizers, rather than mesmerists. For about 75 years from its beginnings in 1779, it was an important specialty in medicine, and continued to have some influence for about another 50 years. Hundreds of books were written on the subject between 1766 and 1925. Today it is almost entirely forgotten. Magnetism dressed up as magnetized water, is the new frenzy for treating kidney ailments: In a 19th cent Commentary on Avicenna's Canon, there is an implication of the impact of the radiation of the soil over the medicinal waters: "His statement contains an important truth. Certain spas and health- resorts (Carlsbad, Bath, Droitwich, Baden, Bourbonnelles- Bams, Is ancy Wiesbaden) owe their virtue not merely to the chemical composition of the water which is taken by the patients, but also to the locality itself. The radiations which pass outwards at those parts of the earth produce a beneficent influence upon them as they walk over the ground" (17). In a more recent article on the efficacy of naturally magnetized water on kidney function, we read: "(...) a daily regimen of 16 ounces of naturally magnetized water was shown to be significant in lowering urine pH, and promoting excretion of acids and toxic mineral salts suggesting an increased ability of the kidneys to remove toxic wastes from the body ..." (40). In

another similar article: "They had their patients drink bi-polar (treated with both North and South poles) magnetized water. This simple treatment was very effective in breaking up kidney and gall bladder stones into small enough particles to be passed through urine without any pain or danger to the patient (41).

Conclusions

Ancient and medieval practices on the use of water are reincarnated today in the more general urge for alternative, traditional, mythical treatments. They are those who look and make steps *Back in the Past* to follow them, there are those who sternly stand for the technological approach turning their back to the past *Moving Forwards*. Nevertheless, both groups in their contrary movements meet harmoniously in the middle like groups dancing the famous Polka dance Podhale (Figure 2).



Figure 2 - The Back and Forth Group Dancing in Podhale in Krokowiak, 1999

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