

Short Communication

Kidney Failure and Dialysis

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In earlier communications [1,2], minor lapses in the healthcare centers are pointed out. In this article, health issues per se pertaining to patients undergoing dialysis are discussed.

Dr Asha Damodaran used to say that every patient is his/her own doctor. One cardiologist started his talk with the sentence "About 90% of our diseases can be traced to what goes inside the mouth and what goes out as waste". I did not realize for many years how true these statements are. It is the purpose of this note to point out our indulgences that lead to problems in pre- and post-dialysis and to learn many lessons. This is an eye opener for those who are in the early stages of kidney failure.

Early Signs of Kidney Failure

Based on monthly Creatinine data, a nephrologist may predict when a patient will most likely will need dialysis. Then the patient should go either for a fistula for hemo-dialysis or a port for peritoneal dialysis. The ideal time for inserting either a Fistula or Port is about three months before the residual function of kidney function falls to about 20%. Some patients ignore this suggestion, as the author did.

The patient is advised to reduce the salt intake to about 900mg per day. This may be achieved with Geringer salt packets which contain roughly 500-600mg and one and half packets per three meals will do. If excess salt intake is continued without any graft or fistula, things get worse and fluid overload results and one need a drastic step of inserting a port in the neck on emergency basis. This lasts about three months.

Peritoneal Dialysis

This requires a port near right or left bottom of tummy. It matures in about two months before it can be used for dialysis. Inside our tummy, there is a very thin bag called the peritonium which acts as a membrane. Through the port the dialysate is pumped in, kept for an hour and then pumped out, and the process is repeated six times. During this hour, the dialysate exchanges toxins inside and removes them by pumping out. This modality requires dialysate bags, tubing, accessories which occupy about 500Cu ft of space. One needs to plan

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well ahead for the inventory. Since this method permits the patient to sleep during the night while the machine does its job. However, for some patients, the dialysate does not drain and the machine pumps the next dose into the peritonem, resulting in extreme discomfort. One must wait for full hour to drain while sitting. This results in sleep disturbance every hour for the next six hours. Normally, the utility of this system lasts on an average 1.5 to 2 years after which the membrane loses its capacity to remove toxins. Then one has to go either for a fistula or a graft on the arm.

In-Center Hemodialysis

If a fistula is inserted, it matures in about three months and will be ready for in-center hemodialysis. This modality is performed thrice a week lasting 3.5 hours each time under supervision. This is comfortable for elders and children who cannot do it themselves. For those who are physically active, the home hemo dialysis is more convenient. The disadvantage of this modality is the need for a second person to be present during the dialysis. Further, a large inventory of tubing, solutions, etc. are to be ordered and stored by the patient occupying space just as in the peritoneal case.

Problem with Hemo Dialysis

Before making this modality a complete success, the crux of the problem is the correct assessment of what is called true 'Dry Weight' of the body. This represents the weight of the body sans any excess fluid without any 'intradialytic symptoms' in the body. I had made several mistakes and 'thought' that I learnt how to circumvent them in arriving at the true dry weight of my body. During early days, I used to get cramps. Some believe that one gets cramps if more than required fluid is removed from the body [3]. This magic number is arrived at by trial and error. On one day I got painful cramps and I became panicky and resisted further removal of fluid on my own. This was a stupid mistake that costed me a lot later.

Regular Bowel Movement

In normal cases, although it is believed that daily Bowel Movement (BM) is desirable, it is not essential. Once in two or three days is acceptable. However, daily BM is important for dialysis patient since it adds to the Dry weight from residual waste. This contributes to the non-existent fluid to be removed and results in cramps. To avoid this, one might apply correction to the weight before dialysis. The patient alone knows this correction.

Efficient Fluid Removal

The reputed nephrologist, Professor Glenn M Chertow, cautioned over a period of time due to fear of cramps the author unknowingly accumulated additional fluid in the blood and subsequently in the lungs due to inadequate dialysis which resulted in shortness of breath, ending in visit to ER where about 4Kg of fluid was removed by dialysis. This brought down the dry weight from 74Kg to 70Kg. This was a great revelation that this undesirable (dangerous) load of fluid is retained. But reaching the 70Kg dry weight goal within 3.5hrs dialysis was too strenuous for the author's age (84 years) and resulted in

extreme fatigue for almost 12hrs after every dialysis session. Professor Chertow then shifted him to 6hrs nocturnal dialysis which improved his well-being and his feeling energetic.

Reason for Feeling Fatigue after Hemo-Dialysis

In a review [3], it was opined why one feels run down after dialysis. The body fluid is essentially in all limbs of the body including the brain. This fluid contains many essential chemicals and body waste called toxins. The latter are being removed continuously 24/7 by healthy kidneys. Once kidneys become inoperative, the job is being done by dialysis. There is a very sensitive equilibrium between the contents of fluid in the blood and the fluid in brain. The brain fluid is separated from the rest of the fluid in the body by a membrane. With healthy kidneys working 24/7, while the toxins are being removed slowly from the blood, the toxins in the brain traverse into our blood without disturbing the equilibrium. On the contrary, during hemo-dialysis, if the fluid/toxin removal from the bulk blood becomes fast (only 3.5hrs as against 24hrs with a healthy kidney), the toxin removal from brain fluid lags behind, and the concentration of toxins goes up, upsetting the equilibrium. This results in neurological problems at the conclusion of dialysis which manifests in the early stages as cramps, headache, etc. If it becomes acute, it can end up in death. This happens in the case of children and that of elderly patients with co morbidities. Then, the solution to this problem is to switch to nocturnal dialysis lasting 6hrs so that the toxins in brain fluid pass slowly across the cell membrane without disturbing the equilibrium.

One more aspect of any dialysis is the dress. Every day after dialysis, the girth of tummy of the patient increases approximately by an inch due to fluid and food intake without urination. At least once a week, between dialysis sessions it increases by 3inches. So fixed waist pants should be avoided. Pants with draw strings are ideal.

Phosphorous and Mitigation

Our body becomes itchy, probably due to dehydration after dialysis. Some believe that it may be due to more than optimum phosphorous in the blood. Excess phosphorous removes calcium in blood. Dialysis does not remove phosphorous. We do not know the amount of phosphorous in our food-intake between dialysis days. Information in our cooked menu is available in literature but that of individual ingredients that go into preparation of the final product is not available. Hence, an attempt was made [4], to give an approximate content of the elements of relevance in individual ingredients used in the different culinary systems. From this, irrespective of the method of cooking, which varies from household to household, one could make a rough estimate of phosphorous in our daily intake of food. Unlike other elements, we have means to remove excess phosphorous ingested by consuming phosphorous binder along with the meal.

Potassium Intake

Too much of potassium in blood affects the heart function. It exists in most of the items of food we consume. Potatoes contain relatively more potassium than others. It is reported that it may be removed to a large extent by soaking the cut pieces in warm water for about three hours (dialyzing), or by heating in hot water for about five minutes

and decanting off the excess water. Similarly, pulses such as lentils can probably be cooked in excess water and decanted. It is not clear that such treatment may be applied to other vegetables also. This is an open topic for research.

Protein and Essential Enzyme Intake

It is estimated that the daily protein requirement of an adult with dry weight of about 70.0 Kg (154lb) is approximately 80gm. Protein loss during normal dialysis [3], is about 10-12gm. Essential enzymes also are lost during the dialysis [5]. For meat eaters, protein and essential enzyme loss can be compensated easily. For a vegetarian, a variety of food items is available to nearly reach this goal for proteins, but none for essential enzymes. Vegetarians may consume a small ball weighing about 20gms after about an hour into dialysis to make up this loss. This ball is prepared [6], by grinding together equal volumes of cashews, groundnuts, almonds, pistachios (kernel removed), sesame seeds, dry coconut, walnut, hot syrup of jaggery and then pressing with one's hand in to small balls. This concoction is rich both in potassium and phosphorous, and should be consumed while watching the monthly blood work results closely for potassium and phosphorous.

Factors Contributing to “You Are Your Own Doctor”

All patients spend a negligible amount of time (may be 30 minutes) once in two months with doctor while indulging unknowingly in all sorts of unhealthy practices during the rest of the period. It is entirely in the hands of the patient to look after his/her health between the visits to the doctor and let the physician / dietician know the indulgences. This is implied in the first sentence of the cardiologist mentioned in the second para of this article.

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