SUMMATIVE INDICATIONS OF INITIATION OF DIALYSIS THERAPY FOR THE NEW CENTURY

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Once a patient has reachsed stage 4 chronickidney disease (CDD) (estimated glomerular filtration rate (eGFR) of -30 ml/minute/1.732), he should be under a nephrologists's care, and the risk factors associated with cardiovascular disease and progression of chronic kidney disease should be optimally managed. Survival of end stage renel disease (ESRD) patients on dialysis depends to a large extent on their condition at the time time dialysis was first initiated. So it is essential to optimize control of blood pressure, anemia, calcium/ phosphorus level, and nutrition during the predialysis period, as well as timely vaccination against HBV and creation of an arterio-venous fistula.

When GFR falls below 10ml/min/1.73m2, the patient develops uraemic syndrome, which consists of symptoms and signs that result from toxic effects of elevated levels of nitrogenous and other wastes in the blood. They include nausea, vomiting soon after awakening, progressive loss of appetite, weakness uraemic encephalopathy, uremic pericarditis or pleurisy, severe metabolic acidosis, hyperkalaemia not controlled with dietary measure or medical therapy. Conventionally, at this stage, haemodialysis is initiated. Indications for urgent dialysis are life threatening htyperkalaemia (associated with ECG changes; usually K =6.5mmol/1/2), acidosis, fluid overload, uraemic pericarditis with or without pericardial temponade.

But in a practical scenario some patients, especiially those with co-morbidities, are more susceptible to various complications of uraemia and may require earlier initiation of dialysis even if eGFR is much more above usual level of initiation of chronic dialysis, i.e. 10 ml/ minute/1.73m2.

The rationale for the approach of early initiation of dialysis is that ultimate survival on dialysis depends greatly on nutritional status, serum albumin, cardiorvascular status, fluid and electrolyte balance, acidosis, and immunological status at the time dialysis is initiated. Patients started early on dialysis (at higher eGFR levels) have higher serum albumin levels. Furthermore, spontaneous protein intake begins to fall early in chronic renal insufficiency (when eGFR is still above 25 ml/1.73m2). CKD state of relative immuno-deficiency; and it progressively leads to various infections like pneumonia, tuberculosis, even to opportunistic infections. With progression of CKD, normal homeostasis and metabolism of many vitamins and micronutrients get impaired, there by predispose to malnutrition and deficiency syndromes. Moreover various studies have documented that risk of cardio-vascular morbidity and mortality significantly increases with progressive worsening of renal functions. Calcium-phosphorus-PTH metabolism also progressively get deranged with deterioration of renal function, and besides worsening of renal bone disease, they are also implicated in cardiovascular morbidity and mortality. Metabolic acidosis, which gradually worsens with deterioration of renal functions, leads to disturbance in protein metabolism, aggravates renal bone disease, affects phagocytic functions, alters cellular metabolisms, and cause weakness and fatigue. Several studies have claimed that early initiation of dialysis results in decrease in mortality and also hospitalization rates 3-7. Therefore, indications of initiation of initiation of dialysis may be revised and classified as **major indications** and **minor or summative indications,** where atient with stage 4 CKD with any of the minor indications may be benefitedfrom early initiation of dialysis. But presence of 3 or more minor indications should be considered as a major indications and dialysis should be initiated.

Major indications or criteria	Summative/minor indication or criteria
1. Uraemic encephalopathy	Any level of GFR or stage 4 CKD with;
2. Metabolic acidosis	
3. Fluid overload or pulmonary edema	1. Severe malnutrition
4. Hyperkalaemia	2. Severe hypoalbuminaemia
5. Udraemic pericarditis	3. EPO resistant anaemia
6. Uraemic G.I. symptoms-nausea, Vomiting, hic-cough, anorexia with	4. Repeated infections
	5. Hypertiension difficult to control Conventional medications
7. Yraenucbeyropathy – foot drop, wrist Drop, tremor, asterixis, multifocal Myoclonus	6. Metabolic bone dispite adequate medical therapy
8. Uraemic coagulopathy EPO	7. Chronic fatigue, despite adequate nutritional supports including
	8. Marked cognitive impairment
	9. Marked sexual dysfunction
	10. Children, with failure to thrive
	11. Advanced cardiac disease – intolerant to Even mild or moderate fluid overload.
	12. Associated co-morbidities like diabetes
	13. Insomnia, or severe pruritus

INDICATIONS FOR DIALYSIS IN ARF;

There are no absolute levels at which dialysis is always needed. The risk is that a patent with moderate hyperkalaemia, acidosis, and mild pulmonary edema may become acutely worse or develop an arrhythmia, and then be un-resuscitable, and dialysis should be initiated early. For patients with multi-organ failure, sepsis syndrome, and postoperative renal failure, sustained low efficiency dialysis (SLED) or continuous renal replacement therapy (CRRT) should be begun early to minimize the deleterious effects of uraemia on myocardial function, bleeding, and wound healing. Poor nutrition and hence low muscle mass may mask severe renal failure by limiting the degree of uraemia. Some patients require dialysis for acidosis or fluid overload despite reasonable renal function. Diabetic patients often require earlier initiation of therapy. Other indications for acute dialyisis include poisoning (lithium.methanol, and ethylene glycol), hypothermia, hyperuricaemia, and metabolic,alkalosis-2,6.

RECOMMENDED READING

1. *Handbook of Dialysis, 4th Edition, John t. Daugirdas*
2. *Oxford Handbook of Dialysis, 2nd Edition*
3. *Brenner and Rector's The Kidney, 8th edition.*
4. *Diseases of the kidney & urinary tract, R.W. Schrier, 8th edition.*
5. *Therapy in Nephrology and Hypertension, C.S. Wilcox, 3rd edition*
6. *Intermitted versus continuous renal replacement therapy for acute kidney injury patients admitted to the intensive care unit: results of a randomized clinical trial – Robert L. Lins et al, Nephrol Dial Tranplant (2009) 24: 512-518*
7. *Short daily and nocturnal haemodialysis, new therapy for new century, MV Rocco, Soudi J Kidney Dis Transplant, 2009;20(1)1-11.*

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