Quality of life in Heamodialysis Patients with Residual Renal Function

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ABSTRACT

Background: patients undergoing maintenance heamodialysis (HD) have a progressively loss of residual renal function (RRF), Short-term morbidity and mortality are significantly higher in patients lost RRF,and these patients frequently die before the development of long –term complications of dialysis. HD patients without preserved RRF have greater hospitalization rate, more significant malnutrition and health related quality of life. **Aim:** the aim of the present study was to assess impact of RRF on QoL in chronic HD patients and to study clinical and laboratory characteristics of these patients.

Patients and Methods: this cross sectional study was carried out on 40 adult clinical stable regular HD Patients. They were divided into 2 groups according to the presence or absence of RRF.Group 1 included 20 HD patients with RRF (defined as urine volume >200 ml/24 h) and group 2 included 20 patients without RRF (defined as urine volume <200 ml/24 h).

Results: patients with preserved RRF had a positive significant correlation between QoL scores, male gender ,younger age, employment, higher BMI (p=0.006), higher hemoglobin (p=0.036), higher predialysis serum creatinine (p=0.033), less complication during HD sessions hypotenstion (p=0.003), hypertenstion(p=0.003), vomiting (p=0.017), cramps(p=0.010)and Less use of Phosphate binders and Erythropoietin dose (p=0.020).

Conclusion: HD patients with preserved RRF had better QoL scores compared to patients without RRF.Efforts to preserve RRF in HD patients could improve outcomes and should be encouraged.

Keywords : residual renal function, heamodialysis, quality of life.

INTRODUCTION

End-stage renal disease (ESRD) is a chronic restrictive illness that affects many aspects of patient's life. Moreover, ESRD has become worldwide public health problem[1]causing a high level of disability in different domains of the patient lives,leading to impaired QoL [2].

Health-related quality of life (HRQOL) is a multi- dimension concept that reflects a patient's perceived well-being and functioning in physical, psychological and social domains of health [3].Subjective HRQoL evaluation has particular importance among patients groups suffering from chronic,degenerative or terminal conditions where the aims of health interventions are to improve QoL rather than a curative effect[4].QoL is related with morbidity and mortality in HD patients,and it is suggested that QoL should be considered in the regular monitoring of dialysis patients[5].

RRF on chronic HD is defined as a urine volume >200 ml/24 h [6].In recent years, there has been a greater focus on RRF of patients on chronic HD [6]. RRF doesn't only reflects remaining glomerular filtration rate (GFR) but it also reflect remaining endocrine functions such as erythropoietin production, calcium, phosphorus and vitamin D homeostasis, volume control, and removal of "middle molecules" as β2-microglobulin or low molecular weight proteins [7,8].

RRF is associated with improved hemoglobin, reduced blood pressure,reduced left ventricular hypertrophy (LVH),and improved QoL [7,8]. Furthermore, it has been shown that clinically important and statistically significant decreases in nutritional parameters occur with RRF loss [6]. Most of studies of RRF were done in peritoneal dialysis(PD),very few studies have analysed the relation between RRF and important outcomes in HD patients [7].The loss of RRF varies from one patient to another,both on HD and on PD, but certain characteristics inherent to HD ,such as episodes of hypotension , volume depletion, and activation of inflammatory mediators associated with the biocompatibility of the dialyser and the dialysate , have been implicated as the primary causes of loss of RRF in these patients [9].

Strategies for preserving RRF start with the recognition of its importance. It must be measured regularly. The choice of dialysis modality is important, but it would be a mistake to think that the requirement to preserve RRF should override other prerogatives .If ambulatory

peritoneal dialysis(APD) is the preferred option, then avoidance of a dry abdomen during the day should be a consideration.If HD is the preferred modality, it would seem that the use of biocompatible, preferably high-flux membranes and the use of ultrapure water gives the best chance of preserving RRF[10].

Blood pressure control is important, but perhaps not at the cost of sustained or profound hypovolemia. Attention to the maintenance of hydration is important in relation to general anesthesia and major surgery. Diuretics have a role in maximizing urine output and minimizing the need for aggressive ultrafiltration . Potentially nephrotoxic agents such as radiocontrast materials, Nonsteroidal antiinflammatory drugs (NSAIDs) , and Angiotensin-converting enzyme inhibitors (ACEi) should be used with caution. Hypercalcemia should be avoided[10].

PATIENTS &METHODS

This study is a cross sectional study of 40 clinical stable adult patients with ESRD on regular heamodialysis in Samanoud General Hospital,Gharbiya Governorate.All patients were on regular HD for at least 3 months,three times /week with each session for at least 4 hours through native AV fistula using a low flux biocompatible membrane (polysulfone hollow fibers) and standard bicarbonate dialysate and heparin anticoagulation. A written consent form was taken from every patient.

Study design

Patients were divided into 2 groups according to presence or absence of RRF. Group 1: included 20 HD patients with preserved RRF defined as urine volume >200 ml/24 h .Group 2: included 20 HD patients without preserved RRF defined as urine volume less than 200 ml/24 h . All patients were subjected to thorough full medical history & clinical examination with special emphasis on age, gender, marital status, occupation, etiology of ESRD , average weight gain, average urine volume ,associated comorbidities ,duration of dialysis and dialysis dosage. BMI =weight (kg)/height^2(meter).

Laboratory investigation

Patients were asked to measure urine volume in days without dialysis and measure volume at least 2 measurments were taken. Data on measured urine volume reported as a dichotomous variable, less than or more than 200ml/24h . Blood samples were collected after an overnight fast from all patients before starting HD session .Serum creatinine,blood urea ,Complete blood picture, S.iron, Total iron binding capacity, S.ferritin and Transferrin saturation ratio S. albumin Parathyroid hormone, S. calcium, Corrected S.calcium, S. phosphorus, Calcium-phosphorus product and C-reactive protein**.**

HRQOL measurement: It will be measured through Short Form 36(questionnaire): SF-36 Questionnaire is a generic instrument that includes 36 items assessing eight scales of functioning ability and health well being of individuals . SF-36 Questionnaire will be filled by all patients.Data will be analyzed from this questionnaire to determine the QoL for all patients based on a score from 0- 100.The higher the score the better QoL. The eight multi-item scales are as follows: **Physical Functioning**: is a Ten – question scale that captures abilities to deal with the physical requirement of life, such as attending to personal needs,walking and flexibility.**Role- Physical**: is a four-item scale that evaluates the extent to which physical capabilities limit activity.**Bodily Pain**: is a two-item scale that evaluates the perceived amount of pain experienced during the most recent 4 weeks and the extent to which that pain interfered with normal work activities. **General Health**: is a Five-item scale that evaluates general health in terms of personal perception. **Vitality**: is a four-item scale that evaluates feeling of energy, and fatigue. **Social Functioning**: is a two-item scale that evaluates the extent and amount of time ,if any, that physical health or emotional problem interfered with family ,friends, and other social interactions during the most recent 4 weeks.**Role-Emotional**: is a Three-item scale that evaluates ,the extent, if any ,to which emotional factors interfered with work or other activities. **Mental Health:** is a Five-item scale that evaluates feelings principally of anxiety and depression. In each dimension the respondent receives a score from 0 to 100. The higher the score, the better the health. An additional one item measure of self evaluation of current health compared to one year ago. Eight subscales can also be combined into two component summary scores. A physical component summary (general health, physical function, role- physical and bodily pain) and a mental component summary (role- emotional, vitality, mental health and social function).

The study was done after approval of ethical board of Ain-Shams university and an informed written consent was taken from each participant in the study.

Statistical analysis

Data were coded, tabulated and statistically analyzed using SPSS program (Statistical Package for Special Science) software version V.20.

Descriptive statistics were done for numerical parametric data as mean, standard deviation(SD),minimum & maximum of the range and for numerical non parametric data as median and 1st & 3rd inter-quartile range ,while they were done for categorical data as number and percentage.

Inferential analyses were done for quantitative variable using independent t- test in cases of two independent groups with parametric data and Mann whitney U in cases of two independent groups with non parametric data . Inferential analyses were done for quanlitative data using Fisher's Exact test for independent variable with small expected values. While Correlation were done using Person Correlation for numerical parametric data,and using spearman rho test for numerical non parametric and categorical data.

The level of significance (S) was taken at P value <0.05 is significant , highly significant (HS) was taken at P value <0.01 or P value <0.001,and non significant (NS) was taken at P value >0.05. The P value is statistical measure for the probability that the result observed in a study could have occurred by chance in population , if it is actually present in it.

RESULTS

This cross sectional study included 40 adult clinically stable patients under regular HD for at least 3 months. They were divided into 2 groups according to presence or absence of RRF.Group 1 included 20 HD patients with preserved RRF.Group 2 included 20 HD patients without preserved RRF.

Results of this study demonstrated that there were many causes for ESRD in the study population , where HTN represents 24%, DM represents 25% in group 1and 40% HTN ,5% DM in group 2 . where HTN and DM were the main causes of renal failure. there was a significant increase in BMI (p=0.006*) in patients with preserved RRF(table1).

As regards group 1, there was a significant increase in frequency of Complications during HD sessions in (Group1) had statistically lower incidence of hypotension(p=0.003*), hypertension (p=0.003*), vomiting (p=0.017*)or cramps(p=0.010*) compared to patients without RRF (Group2) (table1).

There was statistically significant higher Hb (p=0.036*), and lower S.Creatinine(p=0.033*), in patients with RRF comparied to patients without RRF. However, there was no significant difference between both groups regarding Iron profils ,bone mineral markers or CRP(table1).

There were no statistically significant differences between both groups regarding need for Iron, L-carnitine, Phosphate binders, Vit.D supplement dose. However ,the mean dose of Erythropoietin (p=0.020*), was significantly higher in group without RRF and less use of Phosphate binders in group with RRF(table1).

Over all Qol was significantly lower in patients without RRF (Group2) than patients with RRF (Group1).Mental health, general health, physical component summary and mental component summary was significantly lower in patients without RRF (Group2) than patients with RRF (Group1) (table2).

The comparison between employed patients in both studied groups regarding Qol scores. Over all Qol scores were higher in patients with RRF (Group1) than patients without RRF (Group2) was no statistically significant in both studied groups.But the comparison between unemployed patients in both studied groups regarding Qol scores.Over all Qol was significantly lower in patients without RRF (Group2) than patients with RRF (Group1). Physical Functioning, role physical, vitality , mental health , general health , physical component summary and mental component summary was significantly lower in patients without RRF (Group2) than patients with RRF (Group1) (table2).

The comparison between male patients in both studied groups regarding Qol scores. Over all Qol was significantly lower in patients without RRF (Group2) than patients with RRF (Group1). Vitality, mental health, bodily Pains , general Health and mental component summary was significantly lower in patients without RRF (Group2) than patients with RRF (Group1).But the comparison between female patients in both studied groups regarding Qol scores. Over all Qol was significantly lower in patients without RRF (Group2) than patients with RRF (Group1). Physical Functioning , Role Physical, mental health , general Health , Physical component summary and mental component summary was significantly lower in patients without RRF (Group2) than patients with RRF (Group1) (table2).

There was a significant −ve correlation between age and physical functioning,(P= 0.021)

and a significant +ve correlation between age and bodily pains,(P= 0.029) . There was also a significant +ve correlation between dialysis duration and Qol ,vitality, and mental component summary, (P=0.011,0.030 and 0.002) respectively. There was also a significant +ve correlation between predialysis serum creatinine level and Qol,physical functioning and physical component summary (P= 0.008,0.006 and 0.034) respectively.There was also a significant +ve correlation between Hb level and physical functioning , and a significant -ve correlation between corrected Ca and general Health .There was no effect of serum albumin ,PTH or Po4 on quality of life (table3).

Table (1):Baseline characteristics of 40 incident hemodialysis participants in the choice study by RRF.

	Group1 (n=20) Mean±SD	Group 2 (n=20) Mean±SD	P-value
Age(years)	54.95±10.36	53.00±13.41	0.610
Etiology of ESRD(n, %)			
Hypertension	9(45%)	8(40%)	0.749
Diabetics nephropathy	5(25%)	1 (5%)	0.077
Chronic glomerulonephritis(GN)	0(0%)	2(10%)	0.147
Adult Polycystic Kidney Disease	1 (5%)	0(0%)	0.311
Lupus nephritis	1 (5%)	0(0%)	0.311
Chronic pyelonephritis	2(10%)	2(10%)	1.0
Obstructive uropathy	1 (5%)	4(20%)	0.151
Hyperurecemia	0(0%)	1 (5%)	0.311
Pregnancy	0(0%)	1 (5%)	0.311
Unkown	1 (5%)	1 (5%)	1.0
Body mass index (kg/m^2)	30.73 ± 4.67	26.44 ± 4.68	0.006*
Complications during HD sessions			
Hypotension	4 (20%)	12(60%)	0.003*
Hypertension	6 (30 %)	7 (35%)	0.003*
Vomiting	0(0%)	5 (25%)	0.017*
Cramps	4 (20%)	12(60%)	0.010*
Itching	1 (5%)	4 (20%)	0.151
Bone ache	2 (10%)	3 (15%)	0.633
Laboratory			
Creatinine (mg/dl)	8.82±1.81	7.22±2.69	0.033*
Bl. urea(mg/dl)	122.80±37.35	124.55±26.24	0.865
Hemoglobin(g/dl)	10.98±1.63	9.74± 1.94	0.036*
Ferritin(ng/ml)	844.20±663.32	914.68±882.57	0.777
Iron(μg/dl)	92.57±49.44	88.70±38.07	0.783
TIBC(μg/dl)	192.25±68.33	218.85±43.92	0.151
TSAT(%)	47.10±19.84	41.75±20.92	0.412
CRP(mg/dl)	9.24±9.62	12.51±13.96	0.394
PTH(pg/ml)	322.10±273.07	362.35±298.25	0.659
Phosphate(mg/dl)	4.80±1.20	5.27±1.12	0.205
Calcium(mg/dl)	8.17±1.37	8.44±1.14	0.502
Albumin(g/dl)	4.05±0.40	4.30±0.44	0.074
Corrected calcium (mg/dl)	8.08±1.32	8.14±1.22	0.882
CaxP product(mg^2/dl^2)	43.17±12.67	39.18±12.14	0.315
Medications			
Iron injection	13(65%)	12(60%)	0.744
Folic acid supplement	16(80%)	12(60%)	0.168
L-carnitine supplement	20(100%)	18(90%)	0.147
Phosphate binders	12(60%)	15(75%)	0.311
Vit.D supplement	11(55%)	11(55%)	1.0
Erythropoietin dose/wk	2300.00	4500.00	0.020*
Vit.D dose ug/wk	1.58	1.90	0.597

Table (2): Quality of life scores in the two studied groups.

	Group1(n=20) Mean±SD.	Group 2 (n=20) Mean±SD.	P-value
Quality of life scores in the studied groups:			
Physical Functioning	18.65±6.40	16.30±6.33	0.250
Role Physical	5.35±1.81	4.80±1.40	0.290
Role Emotional	4.00±1.41	3.50±1.10	0.220
Vitality	13.95±2.35	12.15±4.65	0.131
Mental Health	19.40±2.26	14.85±5.91	0.003*
Social Functioning	5.20±1.67	5.05±0.94	0.729
Bodily Pains	6.55±2.24	5.60±2.66	0.229
General Health	13.80±2.93	10.00±3.28	0.001*
Quality of Life	86.90±7.46	72.25±18.40	0.002*
Physical Component Summary	44.35±5.48	36.70±8.92	0.002*
Mental Component Summary	42.55±4.62	35.55±11.15	0.013*
Quality of life scores between unemployed patients in the two study groups:			
Physical Functioning	19.89±5.88	14.75±5.53	0.007*
Role Physical	5.33±1.80	4.25±0.87	0.021*
Role Emotional	3.89±1.36	3.33±0.89	0.132
Vitality	14.33±2.60	10.33±4.54	0.002*
Mental Health	19.00±1.73	12.75±6.25	0.001*
Social Functioning	5.22±1.56	4.83±0.94	0.344
Bodily Pains	6.22±2.22	5.75±2.80	0.560
General Health	14.44±3.43	8.42±2.39	0.001*
Quality of Life	88.33±8.47	64.42±18.27	0.001*
Physical Component Summary	45.89±5.40	33.17±8.84	0.001*
Mental Component Summary	42.44±5.08	31.25±11.10	0.001*
Quality of life scores between male patients in the two study groups:			
Physical Functioning	17.89± 7.3	17.9±6.85	0.996
Role Physical	5.22 ± 1.86	5.6±1.65	0.498
Role Emotional	4.00 ± 1.50	3.7±1.25	0.496
Vitality	14.00 ± 2.2	12.5±1.25	0.014*
Mental Health	20.44 ± 2.2	14.7±6.57	0.001*
Social Functioning	5.22 ± 1.99	4.9±0.99	0.524
Bodily Pains	6.78± 2.39	4.6±2.17	0.005*
General Health	13.44±2.46	11.2±3.74	0.031*
Quality of Life	87.00±6.63	75.1±21.74	0.025*
Physical Component Summary	43.33±6.00	39.3±9.55	0.118
Mental Component Summary	43.67±4.24	35.8±13.16	0.015*
Quality of life scores between female patients in the two study groups:			
Physical Functioning	19.27±5.80	14.7±5.64	0.017*
Role Physical	5.45±1.86	4±0.00	0.001*
Role Emotional	4.00±1.41	3.3±0.95	0.073
Vitality	13.91±2.51	11.8±3.94	0.051
Mental Health	18.55±1.97	15±5.52	0.010*
Social Functioning	5.18±1.47	5.2±0.92	0.959
Bodily Pains	6.36±2.20	6.6±2.84	0.767
General Health	14.09±3.36	8.8±2.35	0.001*
Quality of Life	86.82±8.40	69.4±14.96	0.001*
Physical Component Summary	45.18±5.15	34.1±7.85	0.001*
Mental Component Summary	41.64±4.90	35.3±9.45	0.011*

Table (3): Correlation between QoL domains and clinical, laboratory data in preserved RRF group.

Group 1 (n=20)		PF	RP	RE	VT	MH	SF	BP	GH	QoL	PCS	MCS
Age (years)	r	-0.511	-0.159	-0.025	-0.231	0.131	-0.291	0.488	0.036	-0.420	-0.432	-0.167
	p	0.021*	0.504	0.916	0.326	0.581	0.213	0.029*	0.880	0.065	0.057	0.482
Dialysis duration (months)	r	0.173	0.253	0.237	0.557	0.268	0.415	-0.235	-0.122	0.486	0.125	0.638
	p	0.465	0.282	0.313	0.011*	0.254	0069	0.318	0.608	0.030*	0.601	0.002*
Creatinine (mg/dl)	r	0.462	0.479	0.433	0.514	0.461	-0.090	-0.122	0.570	0.578	0.576	0.493
	p	0.040*	0.032*	0.056	0.020*	0.041*	0.706	0.610	0.009*	0.008*	0.008*	0.027*
Hb(g/dl)	r	-0.465	0.139	-0.231	0.112	0.111	0.210	0.143	-0.143	0.124	0.131	0.100
	p	0.039*	0.560	0.328	0.639	0.642	0.375	0.547	0.548	0.602	0.582	0.674
PTH (pg/ml)	r	0.188	0.147	-0.119	0.089	0.028	0.039	-0.011	0.334	0.347	0.442	0.036
	p	0.428	0.538	0.617	0.709	0.908	0.871	0.964	0.151	0.134	0.051	0.879
Sr.Po4 (mg/dl)	r	-0.054	0.330	0.260	0.167	0.231	0.125	0.195	-0.003	0.173	0.071	0.228
	p	0.822	0.155	0.268	0.483	0.326	0.599	0.411	0.991	0.466	0.766	0.333
Corected Ca (mg/dl)	r	-0.283	-0.209	-0.318	-0.031	-0.201	-0.219	0.374	-0.727	-0.268	-0.120	-0.291
	p	0.227	0.376	0.172	0.897	0.395	0.354	0. 105	0.001*	0.253	0.614	0.213
Sr. Albumin (g/dl)	r	-0.210	0.090	0.120	-0.014	-0.069	0.225	0.067	0.444	0.084	0.049	0.077
	p	0.373	0.707	0.616	0.954	0.772	0.339	0.779	0.052	0.726	0.839	0.745
CaxP product (mg²/dl²)	r	-0.231	0.045	0.101	-0.362	-0.288	-0.330	0.308	0.295	-0.235	0.029	-0.414
	p	0.328	0.849	0.671	0.117	0.218	0.155	0.186	0.206	0.319	0.903	0.070

*Correlation is significant at the 0.05 level(2-tailed).r =Person correlation , p=Sig.(2-tailed).PF=Physical Functioning, RP=Role Physical, RE=Role Emotional , VT = Vitalit , MH = Mental Health , SF = Social Functioning , BP=Bodily Pains, GH= General Health, QoL= Quality of Life, PCS=Physical Component Summary and MCS= Mental Component Summary.

DISCUSSION

RRF is in general defined as the residual GFR in patients with ESRD. A progressive decrease in RRF is commonly observed in incident chronic kidney disease (CKD) stage 5 dialyzed patients as functional renal parenchyma is lost. The rate of decrease depends on several factors such as etiology of ESRD, treatment modalities, and exposure to nephrotoxic agents[11].The simplest measure of RRF is urine volume [12].

The understanding that dialysis could not completely replace the function of the kidney highlights the importance of protecting RRF in CKD patients,even after starting dialysis [13]. It could be argued that after a prolonged period on dialysis, anuric patients are qualitatively different from patients with RRF [14].The importance of RRF in HD patients is less well appreciated, and it is believed that RRF declined rapidly in HD patients. Decline of RRF also contributed significantly to anemia, inflammation, and malnutrition in patients with ESRD more importantly, RRF has also been shown to be a powerful predictor of mortality [12]. *Shemin et al.* [15]reported that in the prospective observational study of 114 incident and prevalent patients on

HD, the presence of RRF was independently associated with a 65% decrease in risk of death.

The HRQoL of HD patients is hard-pressed. They not only face the chronic health problems of renal failure but also the intrusiveness of a time-consuming therapy. As a result, the HRQoL of HD patients are lower than in patients with CHF, chronic lung disease, or cancer [3].The common clinical wisdom holds that even small changes in RRF may account for major differences in QoL and dialysis requirements for all ESRD patients[16].SF-36 has been used to study HRQOL in many different chronic disease populations. It consists of 36 questions that form eight health sub-scales: physical functioning, social functioning , physical role limitations, emotional role limitations, bodily pain, mental health, vitality, and general health perceptions. An overall score can be obtained from the SF-36 and the score can also be broken down into two sub-scores:physical and mental component summaries [17].

The study included 40 adult clinical stable regular HD patients . They were divided into 2 groups according to the presence or absence of RRF. Group 1 included 20 HD patients with

RRF(defined as urine volume >200 ml/24 h) and group 2 included 20 patients without RRF(defined as urine volume <200 ml/24 h).Results of this study demonstrated that there were many causes for ESRD in the study population , where HTN represents 24%, DM represents 25% in group 1 and 40% HTN ,5%DM in group 2 . These results agree with those of most studies where HTN and DM were the main causes of renal failure[18].Our results agree with The **Egyptian Renal Registry 9th Annual Report** [19] which reported that the first cause of ESRD was HTN (36.6%).

BMI was significantly higher in patients with preserved RRF than patients without preserved RRF. *Stolic* [20], found that obesity is positively correlated with survival in HD patients, i.e., a high BMI is associated with lower mortality.However, *Shankar et al*. [21]found that a high BMI is a risk factor for progression of kidney

This study showed that patients without preserved RRF had impaired HRQoL in comparison to patients with preserved RRF.This was found in most of SF-36 subscales particularly in mental health, QoL,general health, physical component summary and mental component summary. In preserved RRF patients , our study showed that male gender and younger age were associated with better QoL and a significant negative correlation between age and physical functioning . In addition , males have had higher scores in majority of the SF-36 subscales and over all QoL. *Anca Seica and his colleagues* [25] had found that age had a significant impact on HRQOL especially physical component summary of the SF-36 ,but not on mental component summary.Also Women on HD generally have lower QoL than men due to factors other than clinical ones including difficulty coping with kidney disease , more susceptibility to anemia , anxiety and depressive symptoms with an association between psychological and social factors . In addition, women on HD usually continue performing their traditional roles of home making and child caring and thus are exposed to higher levels of physical and mental stress, resulting in lower QoL than men [26].

Employed patients had significantly better QoL than unemployed patients. Inbetween unemployed patients , Physical Functioning, role physical, vitality , mental health , general health ,

disease. *Hsu et al*.[22]showed that ,each increase in BMI by one standard deviation increases the probability of onset and progression of chronic renal insufficiency by 1.23.

Incidence of complication during HD session was common in patients with preserved RRF,the commonest complication was hypotension (60%), this matched results of *Orofino et al*. [23] who reported that the incidence of a symptomatic reduction in blood pressure during (or immediately following) dialysis ranges from 15 to 50 % of dialysis session.Muscle cramps are a frequent intradialytic complication present in 60% of patients in patients with preserved RRF. This result agrees with that of *Canzanello and Burkart* [24]who reported that 33 % of dialysis patients complain of intradiaylitic muscle cramps which may result in the early termination of a HD session and are therefore a significant cause of underdialysis.

physical component summary and mental component summary was significantly lower in patients without RRF than patients with RRF.In 2007 analysis of baseline data of 9,526 HD patients from seven countries enrolled in phase 1of the Dialysis Outcome and Practice Patterns Study (DOPPS) *Lopes et al*. [27],found that being unemployed (compared with employed) was independently and significantly associated with lower scores in all eight SF-36 scales , with larger differences being observed for role emotional and role physical .

This study also showed a significant positive correlation between predialysis serum creatinine and physical functioning , role physical, vitality mental health,general health ,physical component summary and mental component summary.*Feroze et al*.[28]showed that better QoL was associated with higher predialysis serum creatinine which are surrogates for larger muscle mass and/or greater meat intake.Interestingly, Hb levels were significantly higher in patients with preserved RRF than patients without preserved RRF.This may be responsible for comparable physical functioning subscales between two groups. In our study there was a positive correlation between Hb level and physical functioning subscales.In accord with our results, *Lopes et al*. [27] , found that lower adjusted score in role-physical among patients with Hb<9.0 g/dl compared with Hb >11.0 g/dl. Also lower Hb level was significantly and independently associated with lower scores in

MCS, social function, and role emotional only in the analysis not corrected for multiple comparisons.

There was a significant positive correlation between lower serum corrected calcium and Calcium-Phosphorous Product levels and general health.In agreement with our study, ***Tanaka et al.***[29] In a cross-sectional survey of more than 4000 patients with ESRD in Japan, found no significant difference in mental health scores between patients with low versus high Ca x P. When treated as a linear variable, there was no significant correlation between Ca x P and SF-36 mental health scores. The same authors measured the relationship between serum corrected calcium levels and HRQOL and found that patients with high(>11) versus low (<8.4) calcium had a statistically significant difference in SF-36 mental scale scores.

CONCLUSION

HD patients with preserved RRF had better Qol scores compared to patients without RRF espically physical aspect.The presence of RRF showed a good correlation between Qol, male gender, younger age,employment, higher hemoglobin ,higher perdialysis serum creatinine .

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