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Original Research

Renal Effects Of Anemia In Chronic Kidney Failure

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ABSTRACT

Background: Chronic diseases commonly encounter problems related to the metabolic complications of their kidney disease or hemodialysis complications. Various problems related to vascular access in patients on hemodialysis and to abdominal catheters in patients on continuous ambulatory peritoneal dialysis are also common. It is a study to showing the effect of chronic renal failure on haemoglobin and blood pressure level.**Material and Methods:**This study was conducted on 100 patients which were divided into two groups (Study group and Control group) of 50 patients each; age range between 18-55 years by using the simple random sampling technique.**Results:** Statistical analysis was performed by using SPSS version 17.0 computer software. All the parameters including Haemoglobin, blood pressure were found statistically highly significant ($p<0.001$).**Conclusion:**This study shows that cardiovascular functions significantly deteriorate in Chronic Renal Failure patients.

Key word:- Chronic Renal Failure, Hemoglobin, systolic blood pressure, diastolic blood pressure

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INTRODUCTION

Chronic diseases commonly encounter problems related to the metabolic complications of their kidney disease or hemodialysis complications. Various problems related to vascular access in patients on hemodialysis and to abdominal catheters in patients on continuous ambulatory peritoneal dialysis are also common[1-3]. Even patients undergoing kidney transplantation may experience a variety of transplant-related conditions[4]. Renal failure is a common complication in recipients of nonrenal organ transplantation (Tx)[5]. The clinical impact of acute kidney injury (AKI), chronic kidney disease (CKD). Fluid retention associated with renal failure is particularly poorly tolerated in the lung allograft; the inability of the denervated graft to autoregulate blood flow and the absence of functional lymphatic system to drain away excess alveolar fluid are noted. In the presence of LTx immunosuppressants and in the setting of a fluid-retaining lung allograft, traditional intermittent peritoneal or hemodialysis is very poorly tolerated[6]. Chronic kidney disease (CKD) is an irreversible and progressive disorder characterized by loss of kidney function. ESRD patients eventually need renal replacement therapy via dialysis (subdivided into hemodialysis and peritoneal dialysis) or kidney transplantation in order to survive. As the life expectancy of ESRD patients has increased with improvements in dialysis technology, systemic complications of kidney disease are likely to become increasingly important[7]. Renal failure is a common complication in recipients of non-renal organ transplantation[8]. Indeed, renal dysfunction develops in 55% of adult recipients of lung transplantation (LTx) and in 45% of adult recipients of heart-lung transplantation (HLTx) in the first 5 years after transplantation[9].Possible complications in peritoneal dialysis (PD) patients include fluid accumulation in the pleura, atelectasis, pneumonia and bacterial bronchitis[10].

Other common causes of end-stage renal disease are:

- High blood pressure
- Atherosclerosis

- Autoimmune diseases like systemic lupus erythematosus (lupus)
- Genetic disorders, such as polycystic kidney disease
- Exposure to toxic drugs, including: certain antibiotics, chemotherapy, contrast dyes, Pain relievers etc[11].

AIMS AND OBJECTIVES

1. To study hemoglobin level in Chronic Renal Failure patients
2. To study Blood Pressure in Chronic Renal Failure Patients.

MATERIAL AND METHOD

Present study was conducted in the Department of Physiology & Department of Nephrology, S.P. Medical College & Associated Group of Hospitals, Bikaner to evaluate the Blood pressure and hemoglobin in CRF patients.

This study was conducted on 100 patients which were divided into two groups (Study group and Control group) of 50 patients each; age range between 18-55 years.

Type of Study : Case Control Study.

Method : 100 subjects were divided into two groups.

Group I : 50 CRF patients (Study group)

Group II : 50 normal healthy subjects (control group).

Methodology : simple random sampling technique. In this method every third patient coming to OPD at Department of Nephrology, S.P. Medical College & Associated Group of Hospitals, Bikaner were choose.

Ethical clearance: Ethical clearance was taken from departmental research committee, Department of Physiology, S.P. Medical College, Bikaner as well as Institutional Ethics and Research Board of S.P. Medical College, Bikaner.

Inclusion criteria

1. Chronic Renal Failure Patients
2. Diabetic patients
3. Hypertensive patients

Exclusion Criteria

1. Pregnancy
2. Smoking
3. Severe anaemia due to some other causes such as iron deficiency or hemolytic anaemia.

Equipments:

- Weighing machine
- Mercury column Sphygmomanometer
- Height measuring scale

- **Analysis of Observation**

Standard statistical methods were applied for analysis of the observation. The mean values of various parameters were calculated separately in various groups of the subjects.

- **Statistical analysis**

The data were expressed as Mean±SD. Statistical analysis were performed according to an intension to treat strategy. Quantitative data were presented as mean±SD and the student's unpaired 't' test was sued to compare the differences. All p values were 2 tailed, p value <0.05 was considered significant. Analysis was performed by using SPSS version 17.0 computer software.

OBSERVATIONS

Table 1: Showing distribution of the subjects according to their age group

Age Group (Years)	Study Group		Control Group		Total	
	No.	%	No.	%	No.	%
Young Age (18-35)	25	50.0	40	80.0	65	65.0
Middle Age (36-55)	25	50.0	10	20.0	35	35.0
Total	50	100	50	100	100	100

This table showing age wise distribution of 100 subjects which were divided into two groups of 50 cases each. In study group, equal number of subjects were selected in control group 40 cases in young age group (18-35 years) and 10 subjects in middle age group (36-55 years).

Table 2: Showing the mean value of BMI, SBP and DBP between study and control groups

Parameters	Study Group		Control Group		t	P
	Mean	SD	Mean	SD		
BMI	18.80	3.41	21.29	3.23	3.756	<0.001
Systolic BP	147.16	20.99	114.52	4.29	10.771	<0.001
Diastolic BP	110.00	20.02	83.04	3.24	9.401	<0.001

According to above table, mean BMI in study and control groups were 18.80±3.41 years and 21.29±3.23 years respectively and this difference was found statistically highly significant (p<0.001).

Mean Systolic BP in study and control groups were 147.16±20.99 and 114.52±4.29 mmHg while mean diastolic BP in study and control groups were 110.00±20.02 and 83.04±3.24 mmHg respectively and these differences were found statistically highly significant (p<0.001).

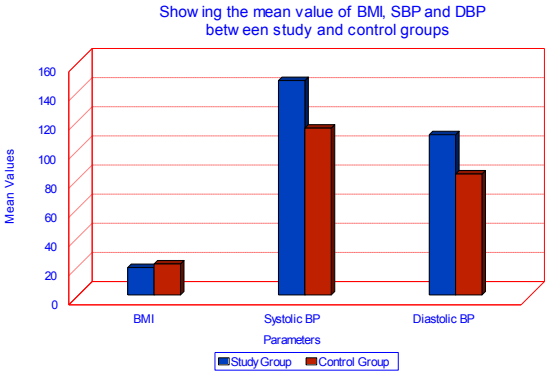

Table 3: Showing the comparison of mean value of Blood Pressure between study and control groups in young and middle age groups

Age	Groups	Systolic BP		Diastolic BP	
		Mean	SD	Mean	SD
Young	Study	146.84	22.42	108.36	21.09
	Control	114.85	4.44	83.00	3.35
t		8.789		7.489	
p		<0.001		<0.001	
Middle	Study	147.48	19.91	111.64	19.18
	Control	113.20	3.55	83.20	2.86
t		5.363		4.629	
p		<0.001		<0.001	

Above table shows comparison of blood pressure according to young and middle age groups between study and control groups. In study group, mean systolic BP in young age group was 146.84±22.42mmHg and in control group it was 114.85±4.44 and the difference was found statistically highly significant (p<0.001). In middle age group, mean systolic BP in study and control group was 147.48±19.91mmHg and 113.20±3.55 mmHg respectively and this difference was also found statistically highly significant (p<0.001). In study group, mean diastolic BP in young age group was 108.36±21.09mmHg and in control group it was 83.00±3.35mmHg and the difference was found statistically highly significant (p<0.001). In middle age group, mean systolic BP in study and control group was 111.64±19.18mmHg and 83.20±2.86 mmHg respectively and this difference was also found statistically highly significant (p<0.001).

DISCUSSION

This cross sectional study was conducted in the department of Physiology Sardar Patel Medical College Bikaner. The study was carried out on 100 subjects between the age group 18-55 years. They were divided into two group: study group and control group. In study group 50 Chronic Renal Failure patients were taken from the department of Nephrology, PBM Hospital while in control group 50 healthy subjects were taken.

After this, anthropometric parameters, haemoglobin and blood pressure of subjects of the study were compared with the control group. The comparison was done considering the age group to which the subjects belonged.

The present study showed that :

Mean BMI in study and control groups were 18.80±3.41 years and 21.29±3.23 years respectively and this difference was found statistically highly significant (p<0.001). Mean Systolic BP in study and control groups were 147.16±20.99 and 114.52±4.29 mmHg while mean diastolic BP in study and control groups were 110.00±20.02 and 83.04±3.24 mmHg respectively and these differences were found statistically highly significant (p<0.001). Anemia, as an inevitable and frequent complication of chronic kidney disease (CKD), is often accompanied by a wide range of clinical symptoms, such as impaired physical capacity, decreased neurocognitive function and poor quality of life both in nondialysis and dialysis patients[12]. Recently, it has been appreciated that anemia begins to develop early in the course of CKD, and the prevalence of anemia in stage 3–5 CKD was 12.0%[13]. Anemia also is an established risk factor for adverse cardiovascular outcomes, and decrease of hemoglobin (Hb) levels is highly associated with reduced production of erythropoietin (EPO). Thus, Erythropoiesis-stimulating agents (ESAs) are always considered to be an alternative therapy and being extensively used for correction of anemia[14]. However, the optimal Hb concentration to be obtained with ESAs remains a matter demanding intense discussion and getting more and more attention following publication of two large randomized trials (CHOIR and CREATE)[15,16]. The National Kidney Foundation-Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) guidelines (2000) recommended that the selected Hb targets should generally be maintained in the range of 11.0 to 12.0 g/dL in patients with CKD, whether or not they were receiving dialysis[17]. The updated KDOQI guidelines in 2006 proposed the Hb level could be expanded to the target range of 11.0 to 13.0 g/dL, with an increase in the upper limit on basis of a finding that high Hb targets mean potential improvement in patients' quality of life[18,19]. The 2007 KDOQI guidelines indicated targeting Hb levels should not exceed 13.0 g/dL[20]. Recent guidelines for clinical practice (2009—2012) suggested that Hb targets should be in the range of 10.0—12.0 g/dL[21]. Accordingly, it is unsurprising that Hb targets have become a matter of considerable interest and consistently being explored by numerous clinical trials. Our study was set up to investigate by meta-analysis

if high Hb levels associate in CKD patients significantly more outcome risk factors than low Hb levels.

CONCLUSION

Our present study showed that blood pressure and haemoglobin level were significantly higher in control group as compared to study group. Hence cardiovascular functions significantly deteriorate in Chronic Renal Failure patients.

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