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RESEARCH ARTICLE

CORRELATION BETWEEN SUBJECTIVE GLOBAL ASSESSMENT (SGA) AND SERUM ALBUMIN IN HEMODIALYSIS PATIENTS

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ABSTRACT

Protein Energy Malnutrition (PEM) and wasting are increases the risk of morbidity and mortality in hemodialysis subjects. Hemodialysis treatment increases the inflammatory cytokines which further increases the PEM in hemodialysis subjects. Assessment of nutritional status paves the way for diagnosing the nutritional status of hemodialysis subjects. Early nutrition assessment helps to decrease the hospitalization of hemodialysis subjects. Subject Global Assessment is the simple tool to assess the nutritional status of hemodialysis subjects which consist of anthropometric measurements and clinical evaluation of edema. Serum albumin was also considered a tool to assess the nutritional status of hemodialysis subjects. Hypoalbuminemia was a powerful predictor of mortality. This study focus on comparing the nutritional status of ninety hemodialysis subjects through Subjective Global Assessment and serum albumin. From this study it was found that there was no correlation between the SGA and serum albumin levels. Hypoalbuminemia does not positively correlate with low Subjective Global Assessment values. And low serum albumin may be also due to poor calorie and protein intake, inflammatory cytokines and fluid accumulation.

INTRODUCTION

Nutritional assessment of patients with chronic kidney diseases is a vital function of healthcare providers. The nutritional status of hospitalized patients can be assessed by a variety of methods. Protein energy wasting is highly prevalent in patients with end stage renal disease maintained on chronic dialysis and is associated with increased mortality (Foque *et al*, 2008 and Fouque & Guerb-Egziaber, 2007). Western and Indian studies report a high prevalence of protein energy malnutrition (PEM) in patients with chronic renal insufficiency (CRI) and in patients with End stage renal disease (ESRD) on dialysis (Sen & Prakash, 2000 and Kopple, 1996). The subjective global assessment (SGA) of nutritional status is a relatively inexpensive, easy, and rapidly conducted tool used by nurses, dieticians or physicians to assess PEW in chronic dialysis patients (Steiber *et al*, 2004).

The strongest evidence comes from Modification of Diet in Renal Disease (MDRD) study (Klahr *et al*, 1994), which is the largest multicentre trial performance in USA. This study showed that, in patients with chronic renal insufficiency, as renal function decreases, dietary protein and energy intake, anthropometric parameters and biochemical markers of nutrition progressively decline. Even the calorie and protein intake of Indian patients with CRI and ESRD is poor (Patel *et al*, 2000). Besides the fact that nutrient intake declines with progressive renal failure, other factors also contribute to malnutrition in patients with CRI. These include decreased nutrient utilization, intercurrent illness, and altered hormonal and metabolic function and imposed restrictions on diet (Sen & Prakash, 2000). Malnutrition has important clinical implications because it is well known that malnutrition is an powerful predictor of morbidity and mortality (Sen & Prakash, 2000 and Blagg, 1995). SGA has been recommended by the National Kidney Foundation (NKF) and Kidney Disease/Dialysis outcomes and Quality initiative (K/DOQI) for use in nutritional assessment in the adult dialysis population (K/DOQI, 2000). The various methods commonly used for assessment of nutritional status are dietary recall, anthropometric measurements and biochemical parameters like albumin, pre-albumin and transferring. These methods have to be used in conjunction, are time consuming and complex. Subjective Global Assessment (SGA) is simple, reliable and dynamic. It provides a sound estimation of nutritional status (Blumenkrantz *et al*, 1980 and Deskty *et al*, 1987)

There are some Western studies that have used the SGA tool for assessing the nutritional status of CRI and dialysis patients

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(Lawson *et al*, 2001, Linda, 1996 and Viesser *et al*, 1999). In Indian literature there is only one study, which has used SGA to assess the nutritional status in Maintenance Hemodialysis patients (Dilip *et al*, 2000).

The present study was undertaken

1. To assess the nutritional status of maintenance hemodialysis patients using SGA assessment.
2. To correlate SGA scorings with serum albumin and BMI.

MATERIALS AND METHODS

Patients

From over 240 patients currently served by Kaliappa Renal Centre, 90 maintenance hemodialysis patients who had never changed their modality of treatment (changed to peritoneal dialysis or transplantation), had not required hospitalization in the month prior to the study, had no signs of infections and who agreed to participate were selected.

Patients ranged in age from 21 to 87 years who are undergoing hemodialysis twice a week for 6 months to 8 years were included in the study.

Assessment of Nutritional status

SGA score was calculated based on the history and physical examination as described by Destky *et al* (1987). The history focused on 7 variables, namely weight change in preceding 6 months and 2 weeks, change in dietary intake, presence of gastro intestinal symptoms, change in functional capacity, subcutaneous loss of fat, muscle wasting and edema. A seven point scoring system was applied to the above 7 variables. The patients were classified into three groups according to the points scored as follows: well nourished (score 1-14), mild to moderately malnourished (score 15-35) and severely malnourished (score 36-49).

Assessments of nutritional status were determined by evaluating anthropometric parameters of Weight, Height, Body Mass Index (BMI), Skinfold measurements, biochemical evaluation of serum albumin, clinical evaluation of presence of fluid accumulation and diet history. Dietary profiles of the selected hemodialysis subjects were determined using the twenty four hour diet recall method. In this study the obtained SGA scorings was correlated with serum albumin and Body Mass Index (BMI).

Statistical Analysis

The obtained data's are expressed as mean ± standard deviation. The results from standard methods were then correlated with SGA scores.

Table 1 and 2 depicts the details about the general characteristics and anthropometric measurements such as height, dry weight, Ideal body weight (IBW), Body Mass Index (BMI), Mid Arm Circumference (MAC), Mid Arm Muscle Circumference (MAMC) and Tricep Skin Fold (TSF) of the selected subjects.

Table 1 Gender and age distribution of the selected subjects

Attributes	Mean±SD
Total number of patients	90
Male (%)	51
Female (%)	39
Age (years)	48.78±13.8

RESULTS AND DISCUSSION

Prevalence of Protein Energy Malnutrition is more common among patients who are undergoing hemodialysis. Many studies on assessment of nutritional assessment in chronic renal disease and end stage renal disease patients have greatly insisted on prevalence of malnutrition with increased risk of mortality and morbidity (Sharma and Sahum, 2001). Early nutritional status assessment in hemodialysis patients helps to prevent the protein energy malnutrition.

Table 2 Serum albumin levels of selected hemodialysis subjects

Serum albumin levels (mg/dl)	No: of Subjects n=90	Percentage %
< 3.5	35	38.9
3.5-3.9	48	53.3
>4	7	7.8

In this study, biochemical parameter such as serum albumin was analyzed and shown in the table 2. Serum albumin the powerful indicator of visceral protein and hence used to assess the nutritional status biochemically. But the decreased serum albumin also relates to other non-nutritional parameters such as inflammation, infection, fluid overload, metabolic acidosis, loss of albumin through urine and during dialysis process (Clinical Practice Guidelines for nutrition in renal failure, 2000). The low serum albumin levels manifested overtly when degree of PEM is high (Tapiawala, 2006). The above table reveals that the serum albumin levels of the subjects who participated in the study. 28% of the subjects were found to have normal serum albumin levels of 4mg/dl (as categorized for hemodialysis patients), 78% percent of the subjects were having serum albumin levels between 3.5mg/dl to 3.9mg/dl and 22% of the subjects had serum albumin levels less than 3.5mg/dl.

Table 3 Subjective Global Assessment

Sga scoring	Degree of Malnutrition	No: of Subjects n=90	Percentage %
1-14	Well nourished	35	38.9
15-35	Moderately malnourished	48	53.3
36-49	Poorly malnourished	7	7.8

Subjective global assessment is the tool consisting seven points used by the healthcare providers to assess the nutritional status and to predict the nutrition associated clinical outcome such as post operative infections (Destky, 1987) and mortality (Canada USA peritoneal Dialysis Study group, 2006). SGA summarizes the subjective and objective aspects of medical history and physical examination (Tapiawala, 2006). It is an inexpensive tool to assess the malnutrition and score of nutritional status (Tapiawala, 2006). SGA scoring details of the selected hemodialysis subjects was summarized in Table 3. 39% of the subjects were well nourished with the scorings between 1-14, 53% of the subjects were mild to moderately malnourished with the scorings between 15-35 and 8% of the subjects were severely malnourished with the scorings between 36-49.

Anthropometric measurements is the semi-quantitative estimate of components of body mass which includes bone mass, muscle mass and fat compositions. It gives information concerning nutritional status either well nourished or over nourished (Heymsfield *et al*, 1984). The above table shows the anthropometric measurements such as height, dry weight, Body Mass Index, Mid Arm Muscle Circumference, Mid Arm

Circumference of the selected hemodialysis patients. Body Mass Index (BMI) was measured by dry weight (post dialytic weight) in kgs divided by height in squares of meters.

Table 4 Anthropometric measurements of the selected hemodialysis subjects

Attributes	Mean ±SD
Height (cms)	160.99±13.8
Dry weight (kgs)	53.96±12.84
Body Mass Index (BMI) (kg/m^2)	20.86±4.27
Mid Arm Circumference (MAC) (cms)	19.49±4.88
Trisep Skin Fold (TSF) (mms)	12.44±10.11
Mid Arm Muscle Circumference (MAMC)	15.91±3.92

Table 5 Correlations between anthropometric measurements, serum albumin and SGA of selected hemodialysis subjects

Attributes	AGE	DRY WT	BMI	Sga Score	Serum Albumin
Age	1	.119	.240(*)	.030	-.120
Dry Wt	.119	1	.821(**)	-.336(**)	-.012
BMI	.240(*)	.821(**)	1	-.339(**)	-.039
Sga Score	.030	-.336(**)	-.339(**)	1	-.069
S. Albumin	-.120	-.012	-.039	-.069	1

* Pearson Correlation is significant at the 0.05 level (2-tailed).
** Pearson Correlation is significant at the 0.01 level (2-tailed).

The above table shows the correlation between anthropometric measurement, serum albumin and SGA of the selected hemodialysis subject. It was observed that there was correlation of SGA scorings with Body Mass Index (BMI) significant at one percent level. But it was observed that there was no correlation between SGA scorings and serum albumin levels.

SUMMARY AND CONCLUSION

In conclusion, our study shows that 39% of the subjects were well nourished, 53% of the subjects were mild to moderately malnourished and 8% of the subjects were severely malnourished which was determined using SGA. Our study does not show any positive correlation between SGA scorings and serum albumin levels but there was correlation between BMI and SGA. So SGA can be used to assess the degree of malnutrition in hemodialysis subjects and serum albumin level cannot be the used to assess the nutritional status of hemodialysis patients since it will be reflected by non-nutritional parameters also.

Bibliography

1. Beheray, S.S and Shah, B.V. 1996. Dietary protein intake in Indian patients with chronic renal failure, Ind J Nephrol., 6: 19-21.
2. Blagg. C. 1991. Importance of nutrition in dialysis patients, American Journal of Kidney Disease., 17: 458-461.
3. Blumenkrantz, M.J., Kopple, J.D., Gutman, R.A., Chan, Y.K and Coburn, J.W. 1980. Methods of assessing nutritional status with renal failure, American Journal of Nutrition., 33: 1567-1585.
4. Canada-USA (CANUSA) Peritoneal Dialysis StudyGroup. 1996. Adequacy of dialysis and nutrition in continuous peritoneal dialysis: Association with clinical outcomes, J Am Soc Nephrol.,7:198-207.
5. Clinical practice guidelines for nutrition in chronic renal failure. Evaluation of Protein-Energy Nutritional Status. 2000. Am J Kidney Dis .,35: S17-21.
6. Destky, A.S., Mc Laughiln, J.R., Baker, J.P., *et al*. 1987. What is subjective global assessment of Nutritional status, Journal of Parenteral and Enteral Nutrition., 1: 8-13.
7. Dilip,R., Bamini, M and Selvamani,A. 2000. Subjective Global Assessment of nutritional status of patients on maintenance Hemodialysis, Indian Journal of Nephrology., 10:163-166.
8. Fouque, D and Guebre-Egziabher, F. 2007. An update on nutrition in chronic kidney disease, Int Urol Nephrology., 39:239-246.
9. Fouque, D., Kalantar-Zadeh, K., Kopple, J., *et al*. 2008. A proposed nomenclature and diagnostic criteria for protein-energy wasting in acute and chronic kidney disease, Kidney Int., 73:391-398.
10. Heymsfield, S.B., Tighe, A., Wang, Z-M. Nutritional assessment by anthropometeric and biochemical methods, in Shils ME, OlsonJA, Shike M (eds): Modern Nutrition in Health and Disease. Philadelphia, PA , Lea and Febiger, 1984, 812-41.
11. K/DOQI, National Kidney foundation: Clinical practice guidelines for nutrition in chronic renal failure. 2000. American Journal of Kidney Disease., 35: S1-140, (Supplement 2).
12. Klahr, S., Levey, A.S and Beck, G. 1994. Modification of Diet in Renal Disease Study group. The effects on dietary protein restriction and blood pressure control on the progression of renal disease, New England J Med., 330: 877-884.
13. Kopple,J.D. MaCollum award lecture, PEM in maintenance dialysis patients, Am J Clin Nutr., 1996., 48: 724-730.
14. Lawson, J.A., Lazrius, R and Kelly, J.J. 2001. Prevalence and diagnostic significance of malnutrition in chronic renal sufficiency. Journal of Renal Nutrition., 11:16-22.
15. Linda Mc Cann.1996. Subjective Global Assessment as it pertains to the nutritional status of Dialysis patient, Dialysis and Transplantation., 25:190-202.
16. Patel, Z., Bhattacharjee, L.J and Shah, B.V. 2000. The role of dietary protein restriction in Indian patients with chronic renal failure, J Assoc Physician India., 48: 1078-81.
17. Sen,D and Prakash, J. 2000. Nutrition in Dialysis patients, J Assoc Physician India., 48: 724-730.
18. Sharma, R.K and Sahum, K.M. Nutrition in dialysis patients 2001. J Indian Med Assoc., 99: 206-8, 210-1, 213.
19. Shruti Tapiawala., Vora, H., Zamrud Patel., SBadve, S and Shah, B. 2006. Subjective Global Assessment of Nutritional Status of Patients with Chronic Renal Insufficiency and EndStage Renal Disease on Dialysis, Journal of the associations of physicians of India., 54: 923-926.
20. Steiber, A.L., Kalanter-Zadeh, K., Secker, D., McCarthy, M., Sehgal, A and McCann, L. Subjective global assessment in chronic kidney disease: a review. 2004. Journal of Renal nutrition.,14: 191-200.

21. Viesser, R., Dekke, F.W., Boeschoten, E.W., Stevens, P and Krediet, R.T. 1999. Reliability of 7-point subjective global assessment scale in assessing nutritional status of dialysis patients, Adv Perit Dial., 15: 222-225.

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