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**INCIDENCE OF MALNUTRITION INFLAMMATION COMPLEX  
SYNDROME IN END STAGE RENAL DISEASE PATIENTS ON  
MAINTENANCE DIALYSIS**

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**Article Received:** January 2019**Accepted:** February 2019**Published:** March 2019**Abstract:**

**Objective:** To determine the incidence of Malnutrition Inflammation Complex Syndrome related to malnutrition (MICS) in patients with end-stage renal disease maintained on hemodialysis.

**Study Design:** A cross-sectional study.

**Place and Duration:** In the Nephrology Department of Services Hospital Lahore for one year duration from June 2017 to June 2018.

**Methods:** In the study, total of 62 patients were selected. All end-stage renal disease patients on maintenance hemodialysis (twice in a week for more than 3 months) were included and patients with chronic infections, chronic liver disease and ARF were not included in the study. To evaluate the Malnutrition Inflammation Complex Syndrome associated with malnutrition, malnutrition inflammation score (MIS) was used. For categorical and continuous variables for percentages or proportions, standard deviation and mean were calculated. To determine the MICS ratio in patients receiving hemodialysis treatment, Chi-square test was used.

**Results:** 46 years  $\pm$  12.59 SD (18-72 years) was the mean age. 34 (55%) were female and 28 (45%) were male. Hemodialysis time was 1 year and 28 (45%) in 26 (42%) patients. The prevalence of complex malnutrition syndrome (MICS) was observed in 60 (97%) patients with mild MICS and in 29 (47%) patients with moderate MICS. MICS syndrome was more common in the 31-40 age group (12% in mild MCIS and 14% in mild MCIS). In females, MICS was higher and in male patients mild.

**Conclusion:** It is supposed that many of the end-stage renal disease patients maintained on hemodialysis treatment (97%) had evidence of (MICS)Malnutrition Inflammation Complex Syndrome.

**Key Words:** Hemodialysis, Malnutrition Inflammation Complex Syndrome, MIS.

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**INTRODUCTION:**

It is suggested that end-stage renal disease (ESCD) patients are more than 2,786,000 worldwide and 2,164,000 approximately patients receive renal replacement therapy as hemodialysis [1]. The mortality rate in patients with assisted hemodialysis is unacceptably high worldwide (11-21% approximately per year in developed countries) [2]. Protein energy malnutrition and Inflammation are more common in the dialysis patients, also called malnutrition syndrome (MICS) [3]. The quality of life, poor clinical results, the hospitalization rate and the high mortality are linked with this syndrome. In end-stage renal disease (ESD) patients malnutrition prevalence is up to 75% maintained on hemodialysis [4]. Subjective global evaluation score (SGA); Five components of the clinical history (dietary intake, weight change, functional capacity, gastrointestinal symptoms, nutritional requirements and association with the disease) and a brief fluid balance in the physical examination to determine the three components. Kalantar-Zadeh et al. In 2001, he developed a inflammation and feeding system based on the (SGA) Global Subjective Assessment and MIS, which also included the Serum albumin, transferrin concentration and Body Mass Index (BMI). In some analysis in the hemodialysis population, MIS was superior to SGA to detect inflammation and malnutrition [5-6]. MIS is associated with the severity of MICS in patients on dialysis has significant relationships with hospitalization, morbidity and mortality [7]. MICS has a high morbidity and mortality, so in the local population, it is important to know the MICS proportion.

**MATERIALS AND METHODS:**

We included 62 patients with deliberate non-probabilistic sampling. All end-stage renal disease patients were treated with hemodialysis and patients

with chronic infections, chronic liver disease and acute kidney injury were not included in the study. End-stage renal disease (ESRD) was defined as a GFR below to 15 ml / min. The malnutrition inflammatory complex syndrome (MICS) is defined as the presence of energy malnutrition and urine protein. Physical examination formula, such as a tape thickness gauge (TSF) and arm muscle circumference (MAMC) measured by a cassette: MAMC = middle arm circumference (MAC) - (3.14 x TSF) and serum albumin and capacity of total iron as binding laboratory measures). The MIS consists of four severe components, each of which varies from 0 (normal) to 3 (severe malnutrition). Therefore, the sum of the 10 components varies between 0 (normal), 1-10 (light), 11-20 (medium) and 21-30 (with abundant nutrition), respectively. (11) Health care hemodialysis (MHD) was defined as hemodialysis twice a week for > 3 months.

**Data collection procedure:** From all patients, the informed consent was taken. Data on personal demographic social data, such as age, sex, malnutrition complex, duration of hemodialysis, complex risk (vomiting, nausea, appetite, diarrhea, functional status) and examination were done after history taking. Physical (thickness of TSF, change of dry weight, MAC), BMI (m<sup>2</sup> / kg weight) and blood samples in predialysis (total iron in serum and serum albumin). The data were entered twice and analyzed in version 18 of SPSS.

**RESULTS:**

62 total patients were included. 46 years  $\pm$  12.59 SD (18-72 years) was the mean age, the mean serum albumin was 3.65  $\pm$  0.56 mg / dl and the BMI was 22.33  $\pm$  3.69 kg / m<sup>2</sup> (21.38 - 23.26) as given in Table I, there were 34 (55%) women and 28 (45%) men of 62 patients.

**TABLE I: DESCRIPTIVE STATISTICS**

<b>Variables</b>	<b>Mean (SD)</b>	<b>95%CI</b>	<b>Range</b>
Age (Years)	46.2 ± 12.6	42.98 to 49.37	18-72
Dry weight (Kg)	57.7 ± 13.3	36.34 to 45.67	41.5-70
BMI (kg/m <sup>2</sup> )	22.3 ± 3.70	21.38 to 23.26	14-30.1
TSF (cm)	1.20 ± 0.50	3.22 to 3.67	0.49-1.5
MAC (cm)	24.1 ± 2.80	21.36 to 45.55	17.7-28.9
MAMC (cm)	20.3 ± 2.70	19.8 to 23.34	16.2-24
TIBC (mg/dl)	256 ± 23.2	35.5 to 39.74	160-350
Serum Albu-min (mg/dl)	3.64 ± 0.55	3.49 to 3.78	2.3-4.9

26 patients (41.9%) had less than one year of MHD and 28 patients (45.2%) were 1-4 years old. The prevalence of MICS was observed in 60 patients (97%) with ESRF using the Malnutrition Inflammation (MIS) score. With respect to the severity of the MICS, mild MICS (1-10 MIS) was observed in 31 (50%) patients, moderate MICS in 29 (47%), (11 to 20 MIS) and severe MICS (21-30) was

not noted in this analysis. The MICS in the age group of 31-40 years was mild and above 60 years of age as compared with 10% (12%) in 41-50 and 51-60 years, respectively. Similarly, the intermediate (MICS) with ages between 31 and 40 (14%) was 12% in the age group 41 to 50 years and 10% in the age group of 51 to 60 years and 4% of MICS were moderate in male patients and moderate in MICS as shown in Table II.

**TABLE II: FREQUENCIES OF VARIABLES**

<b>Variables</b>	<b>Total</b>		<b>Mild MICS</b>		<b>Moderate MICS</b>		<b>P-value</b>
	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	
<b>Age</b>							
<30yrs	10	16%	05	08%	05	08%	
31-40yrs	16	26%	07	12%	08	14%	
41-50yrs	14	22%	06	10%	03	12%	
51-60yrs	12	20%	06	10%	06	10%	
>60yrs	10	16%	07	12%	07	04%	
<b>Gender</b>							
Male	28	45%	18	64%	10	32%	0.030
Female	34	55%	13	38%	21	59%	
<b>Duration of Hemodialysis</b>							
<1 years	26	42%	14	23%	10	17%	
1-4yrs	32	51%	16	27%	16	27%	
>4yrs	04	07%	01	01%	03	05%	0.140

According to the duration of the MHD, the malnutrition inflammation syndrome complex is shown in patients with end-stage renal disease.

#### **DISCUSSION:**

In patients of chronic kidney disease, there are many causes of malnutrition and the causes are multifactorial. Renal failure itself is an inflammatory

and catabolic condition [7-9]. More than 30% of patients having <60 ml / min/ 1.73 m<sup>2</sup> GFR were found to be malnourished according to Garg et al. Therefore, it is clear that renal failure is an important

malnutrition risk factor [10-11]. In our analysis, MICS was present in 97% of patients with ESRD on hemodialysis. This frequency is greater than that of developed countries, which reported 80% of malnutrition [12-13]. This high rate is mainly due to insufficient socioeconomic conditions and inadequate nutrition and malnutrition in developing countries. The majority of the patients were malnourished before going to the dialysis unit due to the insufficiency of the recommendations of the non-renal physicians who tried to treat the renal insufficiency with protein restriction [14]. These not recommended dietary restrictions result in enhanced body catabolism and increased morbidity and mortality. In addition, late referrals to doctors are also a contributing factor. In addition, most of our patients have dialysis due to economic and social problems and insufficient dialysis times. In our study, the mean serum level was  $3.65 \pm 0.56$  g / dl [15]. This was also reported by Anees et al. In some studies, it has been suggested that serum albumin may be normal despite significant anthropometric abnormalities. In our analysis, the average BMI was  $21.93 \pm 3.69$  kg / m<sup>2</sup> and Anees et al. (Mean BMI  $20.7 \pm 4.0$  kg / m<sup>2</sup>).

### CONCLUSION:

In our study, in the majority of our patients with renal failure (97%), it was concluded that the Malnutrition Inflammation Complex Syndrome was due to malnutrition due to end-stage renal disease. This is an alarming figure that takes into account the high morbidity and mortality associated with MICS.

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