

# Prevalence of malnutrition at admission in hospitalized adults at INCMNSZ in Mexico City

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## ABSTRACT

**Background:** Malnutrition is an acute or chronic condition that is associated with an abnormal response to disease and treatment. In Mexico there are few studies that report the prevalence of malnutrition with different diagnostic criteria and small sample size. So the objective of the present study is to determine the prevalence of malnutrition using subjective global assessment in a tertiary care hospital in Mexico City. **Methods:** Adult hospitalized patients were evaluated using the subjective global assessment at admission from August 2013 to July 2014. We included 3,365 subjects, 1,871 (55.6%) females, with a mean age of  $50.60 \pm 18.9$  years and body mass index of  $24.9 \pm 6.0$ . **Results:** Principal diagnoses were oncologic, renal-urologic, and gastrointestinal disease. According to subjective global assessment, the prevalence of malnutrition among admitted patients was 56% (42% moderate and 14% severe malnutrition). The frequency of malnutrition was higher in subjects  $> 60$  years old ( $p < 0.0001$ ) and with gastrointestinal diagnosis at admission.

## RESUMEN

**Introducción:** La desnutrición provoca cambios en la composición corporal debido al aporte insuficiente de nutrientes respecto a las necesidades del organismo, lo cual interfiere en la respuesta normal del huésped a la enfermedad y en el tratamiento. En México existen pocos estudios sobre la prevalencia de la desnutrición realizados con criterios diagnósticos diferentes y tamaños de muestra reducidos. **Objetivo:** Determinar la prevalencia de la desnutrición al ingreso hospitalario mediante la valoración global subjetiva en pacientes del Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán (INCMNSZ). **Métodos:** Estudio realizado en un hospital del tercer nivel donde se determinó, durante el ingreso a hospitalización, la presencia de desnutrición mediante una valoración global subjetiva durante el periodo de agosto de 2013 a julio de 2014. **Resultados:** Se incluyeron 3,365 sujetos, 1,871 (55.6%) mujeres, con una edad promedio de  $50.60 \pm 18.9$  años y un índice de masa corporal de  $24.9 \pm 6.0$  kg/m<sup>2</sup>. Los principales diagnósticos de

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Received for publication: 26-09-2016

Accepted for publication: 25-10-2016

Those patients with malnutrition had higher mortality and length of hospital stay compared with patients without malnutrition ( $p < 0.0001$ ). **Conclusions:** The prevalence of malnutrition was high in a tertiary care hospital in Mexico City, was more prevalent among older subjects, and was associated with longer hospital stay and mortality. (REV MEX ENDOCRINOL METAB NUTR. 2017;4:12-6)

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**Key words:** Hospital admission. Malnutrition. Mexico. Prevalence. Subjective global assessment.

ingreso fueron oncológicos, renal-urológicos y gastrointestinales. La desnutrición tuvo una prevalencia del 56% (moderada: 42%; grave: 14%) y fue mayor en los sujetos  $> 60$  años ( $p < 0.0001$ ) y con diagnóstico de ingreso gastrointestinal. Los sujetos con desnutrición presentaron mayor mortalidad y días de estancia hospitalaria que aquellos sin desnutrición. **Conclusiones:** La prevalencia de la desnutrición en los pacientes hospitalizados en una institución del tercer nivel de la Ciudad de México es elevada y aumenta con la edad.

**Palabras clave:** Desnutrición. Evaluación global subjetiva. Pacientes hospitalizados. Prevalencia. México.

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## INTRODUCTION

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The prevalence of malnutrition in hospitalized subjects has been reported to be from 19 to 80% depending on the country and the groups of patients studied<sup>1</sup>. It is most often seen in the elderly and oncology patient populations<sup>2,3</sup>. Malnutrition has been shown to be associated with high morbidity and mortality, length of hospital stay, deterioration of the quality of life, and higher care costs<sup>4,5</sup>. Malnutrition constitutes a problem in hospitals since it is common that the medical staff do not identify, prevent, or treat it<sup>6,7</sup>.

Most of the hospitalized patients did not cover their estimated energy needs because of increased nutritional needs or decreased food intake (prescription of prolonged fasting before clinical examinations or surgery intervention)<sup>8</sup>. Therefore, it is important to screen the nutritional status of patients at hospital admission in order to identify those patients with or at risk of malnutrition to provide the appropriate nutritional treatment<sup>9</sup>. Several tools have been developed including the subjective global assessment (SGA). The SGA is a useful tool as it is simple, reproducible, and there is no additional cost for the patient<sup>10</sup>.

In Mexico there are few studies that describe the prevalence of malnutrition<sup>11,12</sup>, which varies based

on the criteria used and the timing of assessment to identify a nutrition diagnosis. Because of this, the aim of this study was to determine the prevalence of malnutrition at hospital admission using the SGA in a tertiary care hospital in Mexico City that is a reference center of care in the country. Also, to evaluate if the presence of malnutrition is associated with mortality and length of hospitalization stay.

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## MATERIALS AND METHODS

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In this retrospective study we included patients  $> 18$  years old, admitted consecutively to the hospitalization areas of the Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubiran (INCMNSZ) of Mexico City during the period August 2013 to July 2014. We excluded patients that were hospitalized in critical areas or emergency department or with incomplete data. This study was approved by the Clinical Research and Bioethics Committee of the INCMNSZ and meets the current guidelines of the Helsinki Declaration.

During the first 24 hours of admission, trained staff from the clinical nutrition service and hospital nutrition conducted a standardized, structured interview with each patient as part of the normal activities of the hospital and included: the SGA<sup>10</sup>, demographic and anthropometric (weight and

height) data and diagnosis of admission. The SGA takes into account<sup>10</sup>: weight loss during the previous six months; dietary intake change during the last months and weeks; gastrointestinal symptomatology; and functional capacity of the patient. In the physical exploration, four characteristics were evaluated (loss of subcutaneous fat, muscle wasting, ankle and sacral edema, ascites). The patients were classified as SGA A (well nourished), B (moderately malnourished or suspected of being so), or C (severely malnourished).

Also, data were obtained on length of hospital stay and mortality during hospitalization from the medical record of each patient.

### Statistical analysis

To compare the frequencies of malnutrition in each age group and diagnosis of admission, the Chi-square test was performed to compare age and body mass index (BMI) between malnourished and non-malnourished patients and the Student *t* test for independent samples was performed. To evaluate the differences in mortality between subjective global assessment categories, a Chi-square test was performed stratified by age to control confusion of this variable. A *p* value of 0.05 was considered statistically significant.

## RESULTS

We included in the present study 3,365 patients an average of age of 50.6 years and 1,494 (44.4%) were male with. Table 1 shows the clinical characteristics of the patients in the study; anthropometric data was obtained in 3,139 subjects because the remaining 226 could not stand. Based on BMI, the majority of the patients were classified as normal or overweight. According to the SGA, we found a prevalence of 56% of the patients with malnutrition: 14% classified as C and 42% as B.

When we compared the malnourished subjects according SGA versus the well-nourished subjects we

Table 1. Anthropometric and clinical characteristics of the study population

Variables	n = 3,365
Males, n (%)	1,494 (44.4%)
Age (years)	50.6 ± 18.9
Height (m)*	1.62 ± 0.1
Actual body weight (kg)*	66.1 ± 17.5
BMI (kg/m <sup>2</sup> )*	24.9 ± 6.0
Nutritional status according to BMI, kg/m <sup>2</sup> (%)*	
Malnutrition (< 18.5)	9.0
Normal (18.5-24.9)	45.7
Overweight (25.0-29.9)	30.1
Obesity (> 30)	15.3
Principal hospital admission diagnosis, (%)	
Rheumatology	2.2
Infectology	2.5
Respiratory/Cardiology	7.3
Gastroenterology	12.2
Renal/Urology	13.3
Oncology	18.6
Surgical	20.1
Others	23.8

Data are presented as mean ± standard deviation or as percentages.

\*n = 3,139 patients with body weight and height. BMI: body mass index.

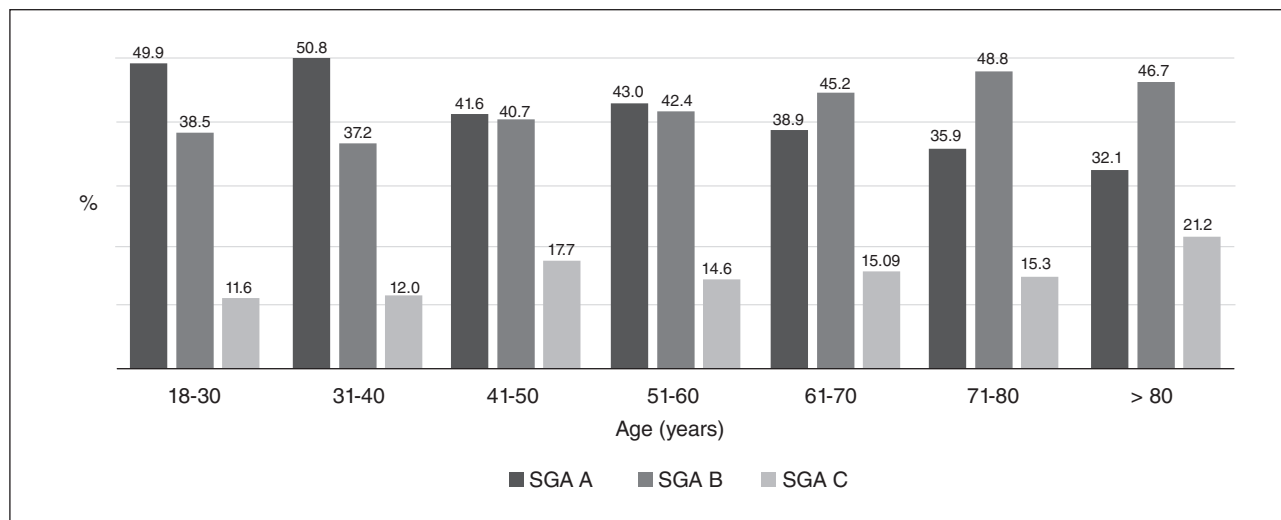
found statistical significant differences in BMI and age. In figure 1 we observe that as age increases, the frequency of malnutrition increases.

Figure 2 depicts the frequency of malnutrition based on the diagnosis of admission, with the highest frequency in patients with gastrointestinal or oncological pathologies (*p* < 0.0001).

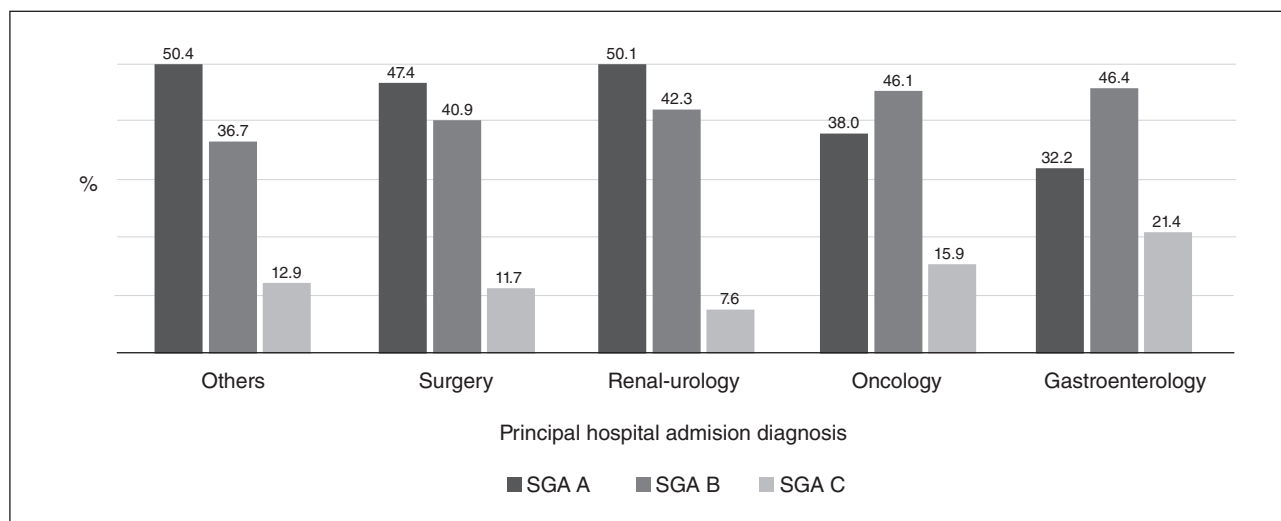
As shown in figure 3, the mortality is higher in patients classified as SGA C, independently of age. Figure 4 shows that patients classified at admission as SGA C have an increased length of hospital stay.

## DISCUSSION

The present study is the first to report the prevalence of malnutrition in a large number of hospitalized patients in Mexico. The prevalence found is in the range described in the literature<sup>1</sup>, although



**Figure 1.** Nutritional status according to subjective global assessment and age. Percentage of patients with subjective global assessment A, B or C by age categories.  $p < 0.0001$ .



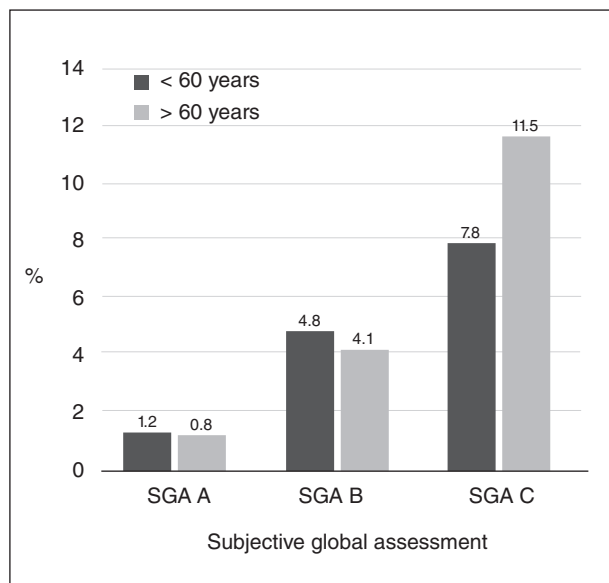
**Figure 2.** Percentage of patients according diagnosis of hospital admission between subjective global categories.  $p < 0.0001$ .

differences can be explained by the variation in methodologies, convenient selection of the population, and the lack of a consistent definition.

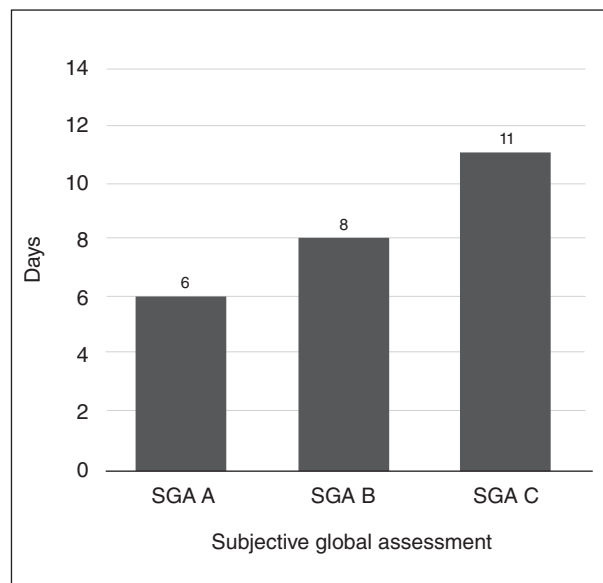
The SGA allows the user to determine the presence of malnutrition, even when the weight and height of the patient is missing. Furthermore, the SGA could be used to detect malnutrition before the change of body composition is reflected by weight as subjects classified as normal using the BMI were found to be malnourished using the SGA.

Another finding in the present study is a large frequency of malnutrition increasing with age, which is consistent with other studies<sup>12,13</sup>. Additionally, the subjects with a diagnosis of gastrointestinal pathology had a major frequency of moderate or severe malnutrition, a result identified in another studies<sup>14</sup>.

Since the patients included were from one hospital in Mexico City, the present study is not representative; however, it gives information about the magnitude of the problem. It is a transversal study so we do not



**Figure 3.** Mortality during hospitalization according to subjective global assessment and age; gray bars: patients  $\geq 60$  years; white bars: patients  $< 60$  years.  $p < 0.0001$ . SGA: subjective global assessment.



**Figure 4.** Comparison of days of hospitalization between subjective global assessment categories.  $p < 0.0001$ . SGA: subjective global assessment.

have data regarding clinical outcomes and the association with length of hospital stays. Further studies with a longitudinal methodology are needed.

## ACKNOWLEDGEMENTS

We are greatly indebted to the Hospital Nutrition and Clinical Nutrition Services for their participation in the SGA application to the patients at INCMNSZ. And we gratefully acknowledge Nakayama Ana, B.S., R.D. for English language editing of the manuscript.

## DECLARATION OF INTEREST

The authors declare that they do not have any conflicts of interest. This study did not benefit from any funding organization in the public or commercial sectors.

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