ORIGINAL ARTICLE

Health-related Quality of Life Evaluated by MOS SF-36 in the Elderly Patients 1 Month before ICU Admission and 3 Months after ICU Discharge

Zineb Zeggwagh[1], Khalid Abidi[2], Mohamed NZ Kettani[3], Amina Iraqi[4], Tarek Dendane[5], Amine Ali Zeggwagh[6]

Abstract

Objectives: The aims of this study were to evaluate changes in health-related quality of life (HRQoL) before ICU admission and after ICU discharge in elderly patients and to determine predictors of this HRQoL.

Materials and methods: This prospective study has been realized in the medical ICU (August 2012-March 2013). All patients 65 years of age or older who were hospitalized for ≥48 hours in our medical ICU have been included. The HRQoL was assessed 1 month prior to ICU admission in all the patients at admission and 3 months after ICU discharge for survivors using the Arabic version of MOS SF-36 questionnaire.

Results: We enrolled 118 patients (66 M: 55.9% and 52 F: 44.1%). The mean age was 72 ± 6 years. ICU mortality rate was 47.5% and three-month mortality rate was 55.1%. The reliability and validity of MOS SF-36 were satisfactory. Among the 53 survivors at follow-up, the subscales of MOS SF-36 decreased significantly at 3 months after ICU stay except the "Bodily Pain". The physical component score (PCS) and mental component score (MCS) decreased also significantly. The independent factors strongly associated with PCS and its variations were: age ($\beta = -1.56$, $p = 0.001$), prior functional status ($\beta = -22.10$, $p = 0.002$) and SAPSII ($\beta = -0.16$, $p = 0.04$). For MCS, these factors were: live alone ($\beta = 16.50$, $p = 0.006$), previous functional status ($\beta = -9.09$, $p = 0.008$) and existence of education level ($\beta = 2.98$, $p = 0.037$).

Conclusion: We demonstrated a fall in the physical and psychical aspects of HRQoL 3 months after ICU discharge in the elderly patients. In addition to factors such as age, prior functional status and severity of illness, family status and educational level seem decisive in the post-ICU HRQoL.

Keywords: Elderly, Intensive care unit, MOS SF36, Quality of life.

Indian Journal of Critical Care Medicine (2020): 10.5005/jp-journals-10071-23489

Introduction

Assessment of health-related quality of life (HRQoL) in elderly patients (EP) after an intensive care unit (ICU) stay involves different factors, such as the environment, psychological, and physiological consequences of the treatment as well as ethical considerations.[1] Thus, the identification of the factors that affect this HRQoL is crucial to guide health professionals and policy makers to the intervention strategies that are geared toward the most efficient use of intensive cares for the EP.[2,3]

The data about the impact of a hospitalization in ICU for the EP are rare in regard to the increasing importance of this population. In fact, the literature provides information about the HRQoL before or after ICU stay, but the studies that deal with the HRQoL variation which is attributable to hospitalization in the ICU for the EP are rare.[4,5]

In Morocco, very few studies have been conducted about the HRQoL after a stay in ICU for all age-groups, and the impact of ICU hospitalization of the EP is not at all known in terms of life quality.[6,7] We, therefore, decided to undertake this study in order to determine whether the ICU had a short-term incidence on the HRQoL of the EP after their discharge.

Thus, the main objective of our study was to measure the HRQoL variations in the EP assessed 1 month before their ICU admission and three months after their ICU discharge. The secondary objective was to identify the factors related to HRQoL observed 3 months after ICU discharge.

[1–3,5,6]Medical Intensive Care Unit, Ibn Sina Hospital, Mohammed V University, Rabat, Morocco

[4]King Fahd Highschool, Abdelmalek Essaadi University of Tanger, Morocco

Corresponding Author: Zineb Zeggwagh, Medical Intensive Care Unit, Ibn Sina Hospital, Mohammed V University, Rabat, Morocco, Phone: +212 661110220, e-mail:zeggwaghzineb@gmail.com

How to cite this article: Zeggwagh Z, Abidi K, Kettani MNZ, Iraqi A, Dendane T, Zeggwagh AA. Health-related Quality of Life Evaluated by MOS SF-36 in the Elderly Patients 1 Month before ICU Admission and 3 Months after ICU Discharge. Indian J Crit Care Med 2020;24(7): 531–538.

Source of support: Nil

Conflict of interest: None

Materials and Methods

This is a monocentric prospective cohort study conducted in the Medical ICU of Ibn Sina Hospital in Rabat from August 2012 to March 2013. All the patients aged 65 and older who were hospitalized for more than 48 hours were consecutively included in this study. The excluded patients were those aged less than 65 years old who expressed either directly or through their relatives an opposition to participate in this study, those who stayed less than 48 hours, those

who presented cognitive troubles, those with psychotic illnesses or terminal illnesses (cancer, heart disease or pulmonary disease, etc.), those who were admitted after a cardiac arrest, or those who have survived from a cardiac arrest during their stay in ICU. The collected data were sociodemographic variables (age, gender, marital status, educational level, address and distance from the hospital, financial revenue, and level of social isolation), previous state of health (Knaus score and McCabe score), severity of the disease upon admission evaluated by SAPS II (simplified acute physiology score II), principal diagnosis, clinical data, therapeutic data (mechanical ventilation, catecholamines and extrarenal epuration), and evolutionary data (ICU mortality, hospital mortality and three-months ICU discharge mortality).

We measured the HRQoL using the Arabic and validated version of the score "Medical Outcome Study Short Form-36 items" (MOS SF-36).[7] The MOS SF-36 is an instrument that measures the generic health state. It is predominantly used and validated in the general population in the primary care settings and also in the severely sick patients.[8,9]

This generalist questionnaire contains 36 items and allows to evaluate eight scales of HRQoL, namely, "physical functioning," "role physical," "bodily pain," "general health," "vitality," "social functioning," "role emotional," and "mental health." The items of this questionnaire are based upon the Likert-type scale with 3 to 6 response options depending on the items. The dimension scores are calculated through adding up the responses to the dimension items and then transforming them.[8] In this way, each score is standardized upon a scale from 0 to 100 (100 represents a well-perceived health level and 0 represents a low level).

In order to reflect a global level of HRQoL of this multidimensional questionnaire that does not provide a total score, the MOS SF-36 scales can be divided into two categories: Physical Component Summary (PCS) and Mental Component Summary (MCS) that represent the physical functioning and emotional well-being, respectively. The PCS sums up the first four dimensions and the MCS the four following others.[8]

When the questionnaire could not be filled in by the patient, we opted for heteroevaluation of the HRQoL. As a consequence, the questionnaire was either enunciated to the patient by a third party, namely, the investigating doctor who was in charge of the study, or enunciated by the closest relative of the patient in case of very limited physical and mental capacities. This approach has been described and previously used in the ICU when patients were not in a position to fill in the questionnaires.[10,11]

In the 48 hours after admission, we proceeded to the retrospective collection of the HRQoL as it was perceived 1 month before ICU admission (a reference value). The assessment of the HRQoL was then prospectively made to the survivors 3 months after their ICU discharge through a phone interview conducted by the same investigating doctor. The questionnaire was completed by the patient or by the closest known member of the family.

Statistics

The assessment of the normal distribution of variables was evaluated using the Shapiro-Wilk test. Qualitative variables were expressed using size, percentages, and confidence intervals of 95%. Quantitative variables were expressed using a mean ± standard deviation and a median and interquartile range. To examine internal consistency reliability of each of MOS-SF-36 scales, Cronbach's α coefficients were calculated. The internal reliability was judged as adequate if $\alpha \geq 0.70$. Convergent and discriminant validities were checked using Spearman correlation. Construct validity was checked by factor analysis using principal component analysis. The Kaiser-Meyer-Olkin (KMO) index and the Bartlett test of sphericity were conducted to verify the adequacy of sampling and the adaptation of the factor model.

The main judgment criterion was the HRQoL variation between the month before ICU admission and 3 months after ICU discharge. The predictive factors of the PCS and MCS obtained 3 months after ICU discharge were evaluated for the survivors.

The used statistical test were chi-square test or Fisher's exact test, Student *t* test or the Mann-Whitney *U* test, and Wilcoxon test for paired sampling. There is also a need to identify variables that may predict conditions under which PCS and MCS will decrease and lead to diminished well-being. Therefore, to determine the predictive factors of PCS and MCS observed 3 months after ICU discharge, simple linear regression was used. The variables for which the significance level *p* value was inferior to 0.2 in a simple linear regression were retained for the multiple linear regression. Statistical analyzes were performed using SPSS software (Statistical Package for the Social Sciences; SPSS Inc.; version 18). A value of *p* value < 0.05 is considered as statistically significant.

Results

Characteristics of Patients

During the period of study, 137 EP were hospitalized of whom 118 patients (66 males: 55.9% and 52 females: 44.1%) were included (Flowchart 1). The average age was 72 ± 6 years (extremes: 65–95 years old) with the following repartition: 35.6% of patients aged less than 70 years old, 28% between 70 and 75 years old, 19.5% between 75 and 80 years old, 14.4% between 80 and 85, and only 2.5% beyond 85 years old. The characteristics of the included patients are reported in Table 1.

The main reasons for hospitalization were acute respiratory distress in 44.9% of the cases ($n = 53$), neurologic deficit in 17% of the cases ($n = 20$), metabolic disorder in 16.1% of the cases ($n = 19$), and severe sepsis in 12.7% of the cases ($n = 15$). The mean duration of stay in ICU was of 7 ± 6.7 days (extremes: 2–40 days; median 5 days, Quartiles: 3–8 days). The mechanical ventilation during hospitalization was necessary for 56 patients (47.5% of the cases) as well as the catecholamines for 64 patients (54.2% of the cases). The ICU mortality rate was 47.5% ($n = 56$; CI95%: 38.5–56.5%) and hospital mortality was 50% ($n = 59$; CI95%: 41–59%). Eleven deaths occurred following a withholding and withdrawal of life support. Three months after ICU discharge, 6 patients died, and the mortality rate was 55.1% ($n = 65$; CI95%: 46.1–64.1%).

Reliability and Validity of MOS SF-36

Results of the reliability analysis showed that the items in the eight scales had a satisfactory discriminating power. All scales met or exceeded the 0.70-level recommendation (0.71–0.93). The global reliability scale for the eight dimensions was 0.91. The relationship of items to scales is as expected, with acceptable α coefficients and any cross-correlations from items to other scales other than their own, confirming the discriminant validity of the scale.

The value of KMO measure of sampling adequacy was 0.903, so we should be confident that factor analysis is appropriate to these data. Bartlett's test is highly significant ($\chi^2 = 993.6$; ddl = 28; *p* value < 0.001), and therefore factor analysis is appropriate.

Flowchart 1: Flowchart of the study

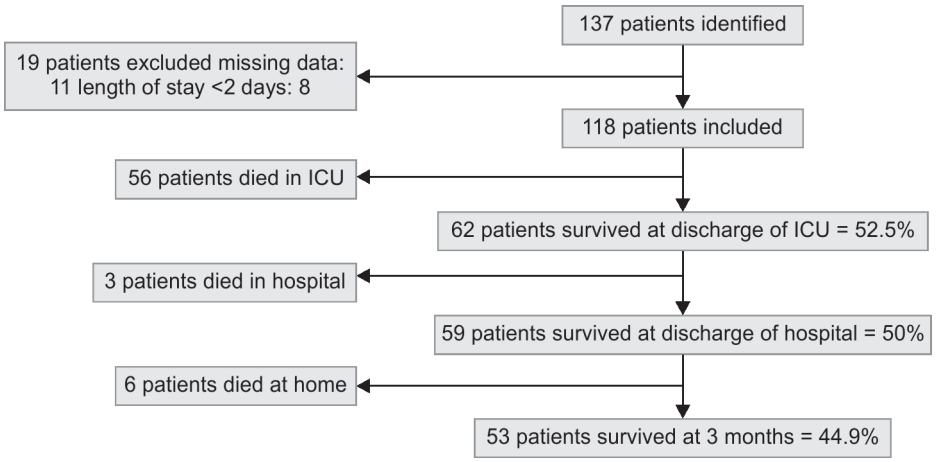

Table 1: Characteristics of the patients (*N* = 118)

Variables		*Mean ± SD or n*	*Median [quartiles]*	*Extremes or (%)*
Age (years)		72 ± 6	70 [67–76]	65–95
Sex M/F		66/52		55.9/44.1
Marital status	• Married	68		57.6
	• Widowed	45		38.1
	• Single	3		2.6
	• Divorced	2		1.7
Educational level	• No	92		78
	• Primary school	13		11
	• High school	8		6.8
	• University	5		4.2
Place of residence	• Urban	86		72.9
	• Rural	32		27.1
Distance: place of residence-hospital (km)		46.5 ± 74	20 [0–40]	5–550
Unemployed		114		96.6
Financial income ($)		200 ± 265	100 [0–300]	0–12000
Social status	• Lives with others	113		95.8
	• Lives alone	5		4.2
Knaus score	• A	17		14.4
	• B	29		24.6
	• C	66		55.9
	• D	6		5.1
McCabe score	• 1	44		37.3
	• 2	57		48.3
	• 3	17		14.4
Antecedents:				
• Diabetes		40		33.9
• Arteriel hypertension		36		30.5
• Chronic respiratory insufficiency		35		29.7
• Depression		11		9.3
• Heart disease		9		7.6
• Chronic liver disease		8		6.8
• Chronic renal insufficiency		6		5.1
• Cancer		7		5.9
• Long-term systemic corticosteroids		4		3.4
• Alzheimer's disease		2		1.7
• Ischemic stroke		2		1.7
• Hypothyroidism		2		1.7
• Systemic disease		3		2.5
Simplified acute physiological score II		38.6 ± 10	38 [31–45.5]	18–65
Glasgow coma scale		12.9 ± 2.5	14 [11–15]	5—15

Table 2: Correlation matrix (8 subscales of MOS SF-36)

Subscales	*Physical functioning*	*Physical role*	*Bodily pain*	*General health*	*Vitality*	*Social functioning*	*Emotional role*
Physical functioning	1						
Role physical	0.678*	1					
Bodily pain	0.355*	0.218§	1				
General health	0.658*	0.526*	0.237¤	1			
Vitality	0.782*	0.616*	0.429*	0.721*	1		
Social functioning	0.778*	0.656*	0.487*	0.667*	0.792*	1	
Role emotional	0.729*	0.745*	0.352*	0.606*	0.690*	0.736*	1
Mental health	0.583*	0.384*	0.446*	0.582*	0.621*	0.675*	0.611*

Determinant: 0.03 * $p < 0.0001$, ¤ $p = 0.002$, § $p = 0.001$; $R \geq 0.70$: strong correlation; $0.30 < R < 0.70$: moderate correlation; $R \leq 0.30$: low correlation

Table 3: Correlations between the eight subscales of MOS SF-36 and aggregate scores

Subscales	*Physical component score*	*Mental component score*
Physical functioning	**0.673**	0.546
Role physical	**0.893**	0.167
Bodily pain	0.125	0.524
General health	**0.522**	0.532
Vitality	0.580	**0.662**
Social functioning	0.583	**0.700**
Role emotional	0.710	0.476
Mental health	0.298	**0.739**

*$p < 0.0001$
Bold values are the subscales belonging to the aggregate scores

Table 4: HRQoL of survivors 1 month before ICU admission and 3 months after ICU discharge ($n = 53$)

	1 month before ICU admission	*3 months after ICU discharge*	
Subscales	*Mean ± SD*	*Mean ± SD*	*p value*
Physical functioning	47.9 ± 25.2	40.6 ± 24.4	<0.0001
Role physical	22.6 ± 32.3	13.5 ± 24.3	0.008
Bodily pain	75.6 ± 26.3	75.7 ± 25.5	0.950
General health	33.8 ± 22.3	25.2 ± 19.4	<0.0001
Vitality	31.1 ± 20.8	27.3 ± 19.1	0.001
Social' functioning	52.8 ± 22.6	44 ± 25.9	<0.0001
Role emotional	42.1 ± 39.3	28.2 ± 35.5	<0.0001
Mental health	59.4 ± 16.1	54.6 ± 16	<0.0001
Physical component score	36.3 ± 8.2	34.3 ± 7.6	0.004
Mental component score	39.7 ± 9.6	36.3 ± 9.3	<0.0001

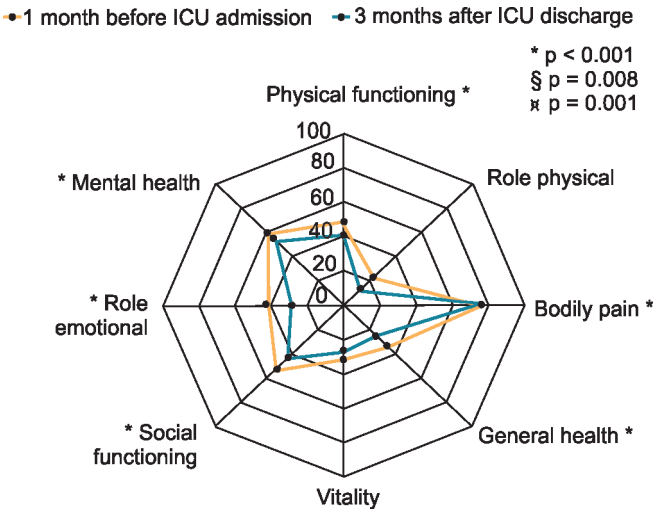

Fig. 1: Graphic representation of MOS SF-36 subscales 1 month before intensive care unit (ICU) admission and 3 months after ICU discharge

The sampling adequacy and the strength of the relationship among factors are verified.

In the preliminary analysis for testing for multicollinearity or singularity, the value of the determinant of the correlation matrix was 0.03 which is greater than the necessary value of 0.00001. Therefore, multicollinearity is not a problem for these data. A correlation matrix was verified for all the factors. The correlation coefficients between the eight subscales of the MOS SF-36 are represented in Table 2. The correlation matrix showed that eight subscales are linearly correlated. Only the "bodily pain" dimension got a weak correlation with the "role physical" dimension ($R = 0.218$) and the "general health" dimension ($R = 0.237$) while maintaining a moderate association with the other dimensions. The loadings of each subscales were high than 0.4: 0.882 for physical functioning, 0.764 for role physical, 0.509 for bodily pain, 0.791 for general health, 0.891 for vitality, 0.910 for social functioning, 0.863 for role emotional, and 0.761 for mental health.

The internal consistencies of the PCS and MCS were 0.78 and 0.86, respectively. Factor analysis was performed to determine that the MOS SF36 measures two dimensions: physical and mental parameters. As in showed Table 3, all the items that should be in PCS (physical functioning, role physical, general health) are in this group except bodily pain that has been substituted with role emotional and the rest are in the MCS with the exception of role emotional.

Evolution of HRQoL in the Survivors

The evolution of the eight subscales scores of MOS SF-36 of the survivors after 3 months of their ICU discharge in comparison to those measured 1 month before ICU admission revealed an almost total decrease except for the "Bodily pain" dimension (Table 4 and Fig. 1). The aggregate scores also decreased together (Fig. 2). Almost two-thirds of the surviving patients ($n = 34$; 64.2%) noted a decrease in their PCS. This rate constituted 81.1% ($n = 43$) for the MCS. The simultaneous decrease in the MCS and the PCS 3 months after ICU discharge was noticed in 52.2 % of patients ($n = 28$), and only 3 patients (5.7%) had an amelioration of PCS and MCS together.

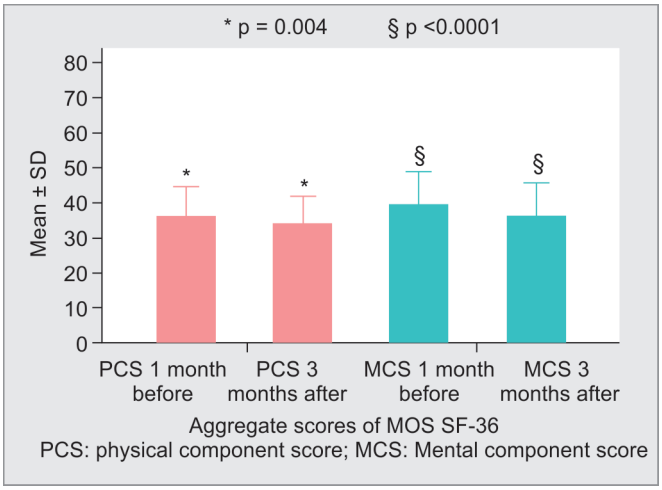

Fig. 2: Evolution of the aggregate scores of MOS SF-36 after intensive care unit (ICU) stay

Predictive Factors for PCS 3 Months after ICU Discharge

In a univariate analysis, the significantly correlated variables of the PCS measured 3 months after ICU discharge were: age ($\beta = -0.57$; p value = 0.003), previous health state according to the Knaus score ($\beta = -21.14$; p value = 0.006), comorbidity prognostic according to the McCabe score ($\beta = -12.83$; p value = 0.018), SAPS II ($\beta = -0.43$; p value = 0.001), and length of stay ($\beta = -0.32$; p value = 0.024). The other variables having reached a significant p value < 0.20 were social isolation ($\beta = -9.70$; p value = 0.07) and existence of an educational level ($\beta = -3.69$; p value = 0.18).

In a multivariate analysis, the independent variables associated with PCS were recorded 3 months after ICU discharge were age ($\beta = -0.56$; p value = 0.003) and previous health state according to Knaus score ($\beta = -22.10$; p value = 0.002). This means the higher age and limited physical activity at ICU admission, the lower the PCS after ICU discharge.

Predictive Factors for MCS 3 Months after ICU Discharge

In a univariate analysis, the significantly correlated variables of MCS measured 3 months after the ICU discharge were social isolation ($\beta = 17.80$; p value = 0.007), previous health state according to the Knaus score ($\beta = -10.94$; p value = 0.003), comorbidity prognostic according to the McCabe score ($\beta = -6.55$; p value = 0.01), and SAPS II ($\beta = -0.33$; p value = 0.049).

In a multivariate analysis, the independent variables associated with the MCS were social isolation ($\beta = 16.50$; p value = 0.006) and previous health state according to the Knaus score ($\beta = -9.1$; p value = 0.008). In other words, the more patients live alone and have less activity limitations, the better their MCS was 3 months after their ICU discharge.

Discussion

Our study revealed an impact of the critical illness on the perception of the HRQoL of the patients aged more than 65 years old who had been admitted in ICU for more than 48 hours and who had survived for at least 3 months after their ICU discharge. In fact, a significant decrease in the scores of the seven subscales of the MOS SF-36 as well as the PCS and the MCS had been noticed 3 months after ICU discharge, hence revealing an alteration in the physical and mental capacities after the ICU stay.

The independent predictive factors of alteration in physical state of the HRQoL observed 3 months after ICU discharge were the agedness and the limitation of activity prior to hospitalization. Regarding the mental health deterioration, the independent predictive factors retained in our study were living with others and the limitation of activity prior to hospitalization.

A gold standard definition of HRQoL does not currently exist. However, researchers agree that HRQoL is a multidimensional concept that encompasses all aspects of survivors' well-being including physical, psychological, social, and spiritual health.[1,12,13] In fact, the HRQoL is a subjective concept that can be interpreted as a gap between health expectations and the current life experience.[12] Thus, people with objectively different levels of functioning and health can declare an equivalent quality of life.[12,13]

In the studies that assess the HRQoL in ICU, the method of self-administration of questionnaires of the HRQoL is rarely used. In general, in ICU, it can be difficult to rely on patients' reports of their true levels of life quality, and relatives are often invited to complete the questionnaire. In our study, we opted for this practice in the patients having cognitive or other serious troubles as has been done in several studies.[11,14–17] In fact, it was demonstrated that the help of a relative during the administration of the questionnaire of the HRQoL is possible without constituting a significant source of error.[18,19] In fact, the reliability of the relatives' responses has been substantiated by several studies using different validated instruments of the HRQoL.[11,18]

Assessing the HRQoL of patients before their admission in ICU is intrinsically difficult, and little research has been conducted in it.[19,20] Some studies choose to compare the HRQoL of the EP to a control group in good health, to matched general population standards, or to younger patients in ICU.[16,17]

Despite their potential limits, we found it useful to invite patients to estimate their HRQoL 1 month before being admitted to ICU in order to have a point of reference upon which to better judge the impact of ICU on their HRQoL.

Regarding the appropriate moment to assess the HRQoL of patients after their discharge from ICU, it is not clearly established.[2] The duration in which the patients are followed up considerably varies from one study to another; it would be in average from 1 to 6 months and can reach 5 years.[5,16,21–23]

The ideal duration of the long-term follow-up should be the one that would be enough to allow recovery in the best possible way in all the aspects of the HRQoL and in which the measurements would not give any additional information. In 2003, a group of experts recommended that patients would be seen again at least 6 months after their ICU discharge and that an assessment of the HRQoL would be made.[24] Some authors justify their choice of a 6-month period by the willingness to minimize abandonments and by the fact that health problems after 6 months are due to underlying chronic conditions or new conditions, especially in the EP.[25]

Before ICU admission, some authors have noticed that the HRQoL of EP was already compromised during the 30 days preceding hospitalization in comparison to a general population.[2]

Concerning the follow-up after the ICU discharge, the results for the future of the HRQoL are disparate. In fact, some authors have reported a significant decrease in the HRQoL during the follow-up, while others have reported a return to the state of preintensive care

and even an amelioration of the HRQoL after 3 to 24 months of their ICU discharge.[14,21,26] Very few studies provide information on the long-term results of the HRQoL on EP in the ICU.[15,21,22]

Big caution is needed in the direct comparison between our results and those of other studies on the HRQoL of EP after a stay in the ICU. In fact, the gaps in results that exist between studies can be due to methodological differences relative to the global conception of the study, to the studied population, sometimes to the measurement instruments used, to the follow-up period after the ICU discharge, to the availability of basic measures, or to differences in terminology.[2,16,27]

Regarding this last point, the variation between studies as far as the definition of the terminology "elderly people" constitutes an insurmountable difficulty in the comparison of the results about the studies.[23] Certain studies do not give a coherent definition of EP although the generally accepted peak is 65 years old to categorize a person within this population.[23] However, it would be erroneous to consider every elderly person of more than 65 years old as constituting a homogeneous group.[23] In fact, the elderly population is quite heterogeneous, and this inspired the stratification of these patients into 3 categories in the form of "young–old" (65–75 years old), "old–old" (75–80 à 85–90 years old), and "oldest–old" (more than 85–90 years old).[4,5,23] The chosen peak age constitutes then a first source of heterogeneity of the results.[5,23]

In order to include all the categories of EP, we opted for the peak of 65 years old in our study, where about two-thirds of the patients corresponded to the category of "young–old" (63.6% of the total population included and 66% among the survivors). Only three patients were aged more than 85 years old in the included population, but no one has survived. The majority of the studies dealt either with patients aged 70 years old and more, a peak corresponding to about two-thirds of our patients or with patients aged more than 80 years old who represent only 16.9% of our population. We therefore better understand the limits of the comparison of our results with those of specific sub-populations.

The big heterogeneity in the obtained results can also be due to the premorbid status of the patients, to the main diagnosis of admission into the ICU, and to the type of ICU (surgical or medical).[4,22,28,29]

It should also be noted that among the main limits of certain studies, we note down the size of the sample, the absence of HRQoL assessment before ICU admission, and, sometimes, the use of nonvalidated measurement scales.[4,16,21,22,28] As such, many studies have not investigated the psychometric proprieties of the instruments used.[23] In our study, we took this particular point into consideration and preferred to use the MOS SF-36 which was already evaluated in our ICU on a general population composed of medical patients. We then studied its reliability and validity in the included EP.[6]

In certain studies, a dissonance between the diminished functioning state and the signaled variations in the HRQoL has been noticed.[5,15,22] A good perception of the HRQoL despite the physical deficiency can be attributable to a drop in the expectations of life by the EP after a serious illness. These patients probably adjust their expectations when they are affected by a serious illness and a handicap, which might lead them to give higher marks to their quality of life.[26] EP encounter life-threatening situations can explain this relative tolerance toward the deterioration in their physical state.[5]

Results of the literature on the factors influencing the HRQoL after a stay in ICU are very variable. A reduced quality of life before admission was found to be correlated with a bad HRQoL after the stay in ICU.[30] As in our study, some authors have also supported the idea that comorbidities can be an important factor for the reduction of the HRQoL dimensions among the patients who were treated in ICU.[17,31] One of the other influential factors cited by different studies, we find the physical capacities of the HRQoL, the age, the admission diagnosis, the severity of the acute disease, the length of stay, and the readmission in the hospital.[3,32,33]

In a study, it was noticed that a low MOS SF-36 is associated with acts of medical care, tracheal aspirations, and changes in position.[34] This has incited authors to insist on the particular attention that should be given to the development and use of methods aiming at reducing suffering during the routine acts of care in ICU because the HRQoL gets affected.[34,35]

The life status (living alone or with others) has been very well analyzed.[4,5,14] One study found a similar result to ours, revealing in this way that the EP who received help from their relatives lived with them with a less good HRQoL than that of people having received no help from relatives.[4] This goes against the idea defended saying that the acceptance of the handicap by the EP is better when they have an active social network.[5,22,36] In fact, in a study involving two groups of patients of more than 80 years old defined by the degree of social isolation, it was noted that those who lived alone have shown a lowering in the score "life and relations with others" (corresponding to "social functioning"), with time significantly more important than those who lived with others.[5] But this role in the family and the society which seems indispensable does not appear in our results which are only concerned with the first 3 months following the ICU discharge. This could suggest a better resilience of the patients who are used to facing life difficulties alone. A more delayed evaluation would have perhaps allowed a better pinning down of this issue.

Our study, which is the first in Morocco and Africa, has many points of strength such as its prospective nature, the inclusion of the medical EP only, the use of a HRQoL scale validated beforehand in our own unit, the confirmation of the reliability and validity of this scale in this current study, and finally the assessment of the HRQoL of patients before ICU admission.

The HRQoL of the severely sick EP after ICU and hospital discharge has been mainly taken into consideration in the developed countries but never specifically in the few studies conducted in the developing countries.[3,37–39]

Yet, certain aspects of our study can limit the interpretation and pertinence of our data. First, our study is monocentric, and, as a consequence, its results cannot be extrapolated to all EP admitted in other ICU.[26] Second, the size of the sample was relatively small, as it was limited to 53 patients. This is common in the monocentric studies of the old populations in ICU where the size was perhaps much less.[21,32,40,41] This limitation is attributable to the high rates of mortality common in the elderly patients who necessitate an admission to ICU.[26] Third, the time period of assessment upon ICU discharge was limited to 3 months only.[26] Certainly, this period allows for the detection of the rapid alterations in the HRQoL, but the extension of this surveillance to 6 months and a year would have provided a much solid estimation of the HRQoL whose evolution after ICU discharge is a dynamic process.[1,5] For purely logistic reasons, we were able to extend this surveillance.

Conclusion

The short-term follow-up of these patients after a stay in ICU highlights an alteration in the HRQoL both at the physical and at the psychic level. Regarding our results, all the factors influencing the HRQoL seem to be intrinsic to the patients themselves and do not seem modifiable at our level. In fact, our results shed light on the societal factors that would deserve to be confirmed.

Our future researches should focus on other variables of preadmission, hospitalization, and follow-up which would determine change targets in the management of these patients in ICU and post-ICU.

References

1. Azoulay E, Kentish-Barnes N, Pochard F. Health-related quality of life: an outcome variable in critical care survivors. Chest 2008;133(2):339–341. DOI: 10.1378/chest.07-2547.
2. Khouli H, Astua A, Dombrowski W, Ahmad F, Homel P, Shapiro J, et al. Changes in health-related quality of life and factors predicting long-term outcomes in older adults admitted to intensive care units. Crit Care Med 2011;39(4):731–737. DOI: 10.1097/CCM.0b013e318208edf8.
3. Mafra JM, Maria da Silva J, Yamada da Silveira LT, Fu C, Tanaka C. Quality of life of critically ill patients in a developing country: a prospective longitudinal study. J Phys Ther Sci 2016;28(10):2915–2920. DOI: 10.1589/jpts.28.2915.
4. Kaarlola A, Tallgren M, Pettilä V. Long-term survival, quality of life and quality adjusted life-years among critically ill elderly patients. Crit Care Med 2006;34(8):2120–2126. DOI: 10.1097/01.CCM.0000227656.31911.2E.
5. Viricel L, Auboyer C, Sauron C, Mathern P, Gonthier R. Devenir et qualité de vie d'une population âgée de plus de 80 ans trois mois après un séjour en réanimation. Ann Readapt Med Phys 2007;50(7):590–599. DOI: 10.1016/j.annrmp.2007.03.015.
6. Khoudri I, Zeggwagh AA, Abidi K, Madani N, Abouqal R. Measurement properties of the short form 36 and health-related quality of life after intensive care in Morocco. Acta Anaesthesiol Scand 2007;51(2):189–197. DOI: 10.1111/j.1399-6576.2006.01225.x.
7. Khoudri I, Belayachi J, Dendane T, Abidi K, Madani N, Zekraoui A, et al. Measuring quality of life after intensive care using the Arabic version for Morocco of the EuroQol 5 dimensions. BMC Res Notes 2012;5(1):56. DOI: 10.1186/1756-0500-5-56.
8. Leplège A, Ecosse E, Pouchot J, Coste J, Perneger T. Le questionnaire MOS SF-36. Manuel de l'utilisateur et guide d'interprétation des scores. Paris: Éditions ESTEM; 2001. p. 156.
9. Chrispin PS, Scotton H, Rogers J, Lloyd D, Ridley SA. Short form 36 in the intensive care unit: assessment of acceptability, reliability and validity of the questionnaire. Anaesthesia 1997;52(1):15–23. DOI: 10.1111/j.1365-2044.1997.015-az014.x.
10. Capuzzo M, Grasselli C, Carrer S, Gritti G, Alvisi R. Quality of life before intensive care admission: agreement between patient and relative assessment. Intensive Care Med 2000;26(9):1288–1295. DOI: 10.1007/s001340051341.
11. Hofhuis J, Hautvast JL, Schrijvers AJ, Bakker J. Quality of life on admission to the intensive care: can we query the relatives? Intensive Care Med 2003;29(6):974–979. DOI: 10.1007/s00134-003-1763-6.
12. Carr AJ, Gibson B, Robinson PG. Is quality of life determined by expectations or experience? BMJ 2001;322(7296):1240–1243. DOI: 10.1136/bmj.322.7296.1240.
13. Iwashyna TJ, Netzer G. The burdens of survivorship: an approach to thinking about long-term outcomes after critical illness. Semin Respir Crit Care Med 2012;33(4):327–328. DOI: 10.1055/s-0032-1321982.
14. Konopad E, Noseworthy TW, Johnston R, Shustack A, Grace M. Quality of life measures before and one year after admission to an intensive care unit. Crit Care Med 1995;23(10):1653–1659. DOI: 10.1097/00003246-199510000-00008.
15. Udekwu P, Gurkin B, Oller D, Lapio L, Bourbina J. Quality of life and functional level in elderly patients surviving surgical intensive care. J Am Coll Surg 2001;193(3):245–249. DOI: 10.1016/s1072-7515(01)00994-2.
16. de Rooij SE, Govers AC, Korevaar JC, Giesbers AW, Levi M, de Jonge E. Cognitive, functional and quality of life outcomes of patients aged 80 and older who survived at least 1 year after planned or unplanned surgery or medical intensive care treatment. J Am Geriatr Soc 2008;56(5):816–822. DOI: 10.1111/j.1532-5415.2008.01671.x.
17. Orwelius L, Fredrikson M, Kristenson M, Walther S, Sjöberg F. Health-related quality of life scores after intensive care are almost equal to those of the normal population: a multicenter observational study. Crit Care 2013;17(5):R236. DOI: 10.1186/cc13059.
18. Rogers J, Ridley S, Chrispin P, Scotton H, Lloyd D. Reliability of the next of kins'estimates of critically ill patients'quality of life. Anaesthesia 1997;52(12):1137–1143. DOI: 10.1111/j.1365-2044.1997.240-az0374.x.
19. Pierre U, Wood-Dauphinee S, Korner-Bitensky N, Gayton D, Hanley J. Proxy use of the Canadian SF-36 in rating health status of the disabled elderly. J Clin Epidemiol 1998;51(11):983–990. DOI: 10.1016/s0895-4356(98)00090-0.
20. Graf J, Koch M, Dujardin R, Kersten A, Janssens U. Health-related quality of life before, 1 month after, and 9 months after intensive care in medical cardiovascular and pulmonary patients. Crit Care Med 2003;31(8):2163–2169. DOI: 10.1097/01.CCM.0000079607.87009.3A.
21. Chelluri L, Pinsky MR, Donahoe MP, Grenvik A. Long-term outcome of critically ill elderly patients requiring intensive care. JAMA 1993;269(24):3119–3123. DOI: 10.1001/jama.1993.03500240063027.
22. Montuclard L, Garrouste-Orgeas M, Timsit JF, Misset B, de Jonghe B, Carlet J. Outcome, functional autonomy and quality of life of elderly patients with a long-term intensive care unit stay. Crit Care Med 2000;28(10):3389–3395. DOI: 10.1097/00003246-200010000-00002.
23. Hennessy D, Juzwishin K, Yergens D, Noseworthy T, Doig C. Outcomes of elderly survivors of intensive care. A review of the literature. Chest 2005;127(5):1764–1774. DOI: 10.1378/chest.127.5.1764.
24. Angus DC, Carlet J. Surviving intensive care: a report from the 2002 Brussels Roundtable. Intensive Care Med 2003;29(3):368–377. DOI: 10.1007/s00134-002-1624-8.
25. Hofhuis JG, Spronk PE, van Stel HF, Schrijvers GJ, Rommes JH, Bakker J. The impact of critical illness on perceived health-related quality of life during ICU treatment, hospital stay, and after hospital discharge: a longterm follow-up study. Chest 2008;133(2):377–385. DOI: 10.1378/chest.07-1217.
26. Tabah A, Philippart F, Timsit J, Willems V, Français A, Leplège A, et al. Quality of life in patients aged 80 or over after ICU discharge. Crit Care 2010;14(1):R2. DOI: 10.1186/cc8231.
27. Vest MT, Murphy TE, Araujo KL, Pisani MA. Disability in activities of daily living, depression, and quality of life among older medical ICU survivors: a prospective cohort study. Health Qual Life Outcomes 2011;9(1):9. DOI: 10.1186/1477-7525-9-9.
28. Garrouste-Orgeas M, Timsit JF, Montuclard L, Colvez A, Gattolliat O, Philippart F, et al. Decision-making process, outcome, and 1-year quality of life of octogenarians referred for intensive care unit admission. Intensive Care Med 2006;32(7):1045–1051. DOI: 10.1007/s00134-006-0169-7.
29. Rellos K, Falagas ME, Vardakas KZ, Sermaides G, Michalopoulos A. Outcome of critically ill oldest-old patients (aged 90 and older) admitted to the intensive care unit. J Am Geriatr Soc 2006;54(1):110–114. DOI: 10.1111/j.1532-5415.2005.00544.x.
30. Welsh CH, Thompson K, Long-Krug S. Evaluation of patient-perceived health status using the medical outcome survey short-form 36 in an intensive care unit population. Crit Care Med 1999;27(8):1466–1471. DOI: 10.1097/00003246-199908000-00011.
31. Orwelius L, Nordlund A, Nordlund P, Simonsson E, Bäckman C, Samuelsson A, et al. Pre-existing disease: the most important factor for health related quality of life long-term after critical illness: a prospective, longitudinal, multicentre trial. Crit Care 2010;14(2):R67. DOI: 10.1186/cc8967.

32. Oeyen SG, Vandijck DM, Benoit DD, Annemans L, Decruyenaere JM. Quality of life after intensive care: A systematic review of the literature. Crit Care Med 2010;38(12):2386–2400. DOI: 10.1097/CCM.0b013e3181f3dec5.
33. Dowdy DW, Eid MP, Sedrakyan A, Mendez-Tellez PA, Pronovost PJ, Herridge MS, et al. Quality of life in adult survivors of critical illness: a systematic review of the literature. Intensive Care Med 2005;31(5):611–620. DOI: 10.1007/s00134-005-2592-6.
34. Jeitziner MM, Zwakhalen SM, Bürgin R, Hantikainen V, Hamers JP. Changes in health-related quality of life in older patients one year after an intensive care unit stay. J Clin Nurs 2015;24(21-22):3107–3117. DOI: 10.1111/jocn.12904.
35. Schelling G, Stoll C, Haller M, Briegel J, Manert W, Hummel T, et al. Health-related quality of life and posttraumatic stress disorder in survivors of the acute respiratory distress syndrome. Crit Care Med 1998;26(4):651–659. DOI: 10.1097/00003246-199804000-00011.
36. Cox CE, Carson SS, Lindquist JH, Olsen MK, Govert JA, Chelluri L, et al. Differences in one-year health outcomes and resource utilization by definition of prolonged mechanical ventilation: a prospective cohort study. Crit Care 2007;11(1):R9. DOI: 10.1186/cc5667.
37. Morsch C, Thomé FS, Balbinotto A, Guimarães JF, Barros EG. Health-related quality of life and dialysis dependence in critically ill patient survivors of acute kidney injury. Ren Fail 2011;33(10):949–956. DOI: 10.3109/0886022X.2011.615966.
38. Quispe-Laime AM, Fiore C, González-Ros MN, Bettini JE, Rolfo VE, Campagne CG, et al. Lung diffusion capacity and quality of life 6 months after discharge from the ICU among survivors of acute respiratory distress syndrome due to influenza A H1N1. Med Intensiva 2012;36(1):15–23. DOI: 10.1016/j.medin.2011.09.007.
39. Contrin LM, Paschoal VD, Beccaria LM, Cesarino CB, Lobo SM. Quality of life of severe sepsis survivors after hospital discharge. Rev Lat Am Enfermagem 2013;21(3):795–802. DOI: 10.1590/S0104-11692013000300020.
40. Fakhry SM, Kercher KW, Rutledge R. Survival, quality of life, and changes in critically ill surgical patients requiring prolonged ICU stays. J Trauma 1996;41(6):999–1007. DOI: 10.1097/00005373-199612000-00010.
41. Wehler M, Martus P, Geise A, Bost A, Mueller A, Hahn EG, et al. Changes in quality of life after medical intensive care. Intensive Care Med 2001;27(1):154–159. DOI: 10.1007/s001340000769.