Correlations between the ISAR Score and the ADL and IADL Indexes. Implications in Geriatric Nursing

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Abstract
A demographic shift has occurred in the last decades in developed countries that have resulted in a considerable rise in the number of elderly patients. In this study the Identification of Seniors at Risk (ISAR) index was correlated to the Activities of Daily Living (ADL) index and the Instrumental Activities of Daily Living (IADL) index, in order to evaluate the influence of the ISAR score on the ADL and IADL indexes. Forty elderly subjects were enrolled in this study. Of these, twenty were male and twenty were female. From each participant a questionnaire was administered, which contained the ISAR score, the ADL and the IADL indexes. Correlations between the ISAR index and the ADL and the IADL scores were all statistically significant (p<0.05 and p<0.001). These simple screening tools predict functional impairment in older subjects. It is also moderately predictive of subsequent functional decline after an initial assessment. The ISAR with the ADL and the IADL score seem to be positively correlated and to provide a valid proxy measure for assessing functional status in older patients.

INTRODUCTION
A demographic switch has aroused in the last decades in developed countries that has resulted in an increase in elderly population. Thus, the study and care of elderly subjects have become priority topics for researchers and clinical nursing practitioners [1].

Current literature suggests different scores to assess several physical, mental aspects of the elderly population [2]. However, daily functioning is an important predictor in older health status. In fact, for patients and caregivers, prognostic information is needed to inform decisions concerning and decision making in clinical management, discharge plan, and follow up.

Moreover, mortality in older subject’s results from a combination of biological, functional, psychological, pathological, and environmental factors, so tools that effectively indicate patients with low life expectancy should consider a multidimensional approach. For over 30 years scientific literature has suggested several predict indexes for older patients based on their functional, biological, and environmental characteristics as regard population-based, community dwelling, or institutionalized subjects. Although its value in general practice remains uncertain today, too [3].

In this study the Identification of Seniors at Risk (ISAR) index has been correlated to the Activities of Daily Living (ADL) score and the Instrumental Activities of Daily Living (IADL) score, in order to evaluate the influence of the ISAR index on the ADL and IADL indexes. The ISAR screening tool aims to identify groups of patients who suffer from severe disability or who are at risk of developing adverse outcomes.

The ISAR screening tool allows for the early identification in the emergency departments of seniors at increased risk, thus allowing specific clinical services to be delivered more efficiently to deal with the particular needs of these patients. It is important to bear in mind that the ISAR tool is not a diagnosed tool and must be linked to process of follow up, including a clinical evaluation. It should never replace the judgement of health care providers [4].

ADLs are tasks related to personal care. The ADL score looks at four of these tasks: transfer, bed mobility, toileting and eating. The resident’s self performance and the amount of staff support provided are evaluated for all of these tasks [5].

The IADL scale is an appropriate instrument to assess independent living skills. These skills are considered more complex than the basic activities of daily living as measured by the Katz Index of ADLs [6]. The instrument is most useful for...
identifying how a person is functioning at the present time and for identifying improvement or deterioration over time.

**MATERIALS AND METHODS**

**Participants**

Forty elderly subjects were enrolled in this study. Of these, twenty were male and twenty were female. All the subjects lived in a nursing home. From each participant a questionnaire was administered, which assessed ISAR score, ADL and IADL indexes. Then, correlations between ISAR score and ADL and IADL indexes were evaluated. Results were distinct into two groups: the male group and the female group.

**The ISAR score**

The ISAR questionnaire consisted in six questions, which covered the most frequent observed problems in elderly in the emergency departments, such as functional loss, cognitive impairment, polypharmacy, visual impairment and frequent hospitalizations.

Each question had two possible responses: "yes" or "no". The answers were scored as "01" or "00", respectively. Then, the total score was used quantify the screening.

The ISAR has been tested in North America, many European countries and Hong Kong where its predictive value varied between "fair" and "poor".

**The ADL score**

The ADL self-performance questionnaire assessed what the elderly person actually did within each ADL category over the prior seven days, according to a performance-based scale. ADL self-performance coding varied from 0 (independent) to 4 (total dependence) and it was coded as:

- **“0”**: independent. The subject completed the activity with no help or over-sight every time during the seven day look back period;
- **“1”**: supervision. The subject needed encouragement in his activity and he received help three or more times during the last seven days;
- **“2”**: limited assistance. The subject was highly involved in the activity and received physical help in guided manoeuvring of limb or other non-weight-bearing assistance three or more times during the last seven days;
- **“3”**: extensive assistance. The subject performed part of the activity over the last seven days, help of the following type was provided three or more times in weight bearing support provided and full staff performance of activity during part, but not all, of the last seven days;
- **“4”**: total dependence. The subject was unwilling or unable to perform any part of the activity over the entire seven day look back period;
- **“7”**: activity occurred only once or twice. The subject did not participate in the activity occurred three times or more;
- **“8”**: activity did not occur. The subject was unable to perform his daily activity. He needed physical help in every activity, every time.

**The IADL score**

The IADL score consisted in 8 domains concerning function measured with the Lawton IADL scale. Historically, women were scored on all 8 areas of function; while men were not scored in the domains of food preparation, housekeeping, laundering. However, current recommendations were to assess all domains for both genders. Subjects were scored according to their highest level of functioning in that category. A summary score ranges from 0, which represented low function, such as dependent condition, to 8, which represented high function, such as independent condition.

**RESULTS**

All participants agreed to answer to the questionnaire. The male group aged 82 ± 7 years. The female group aged 85 ± 5 years. The ISAR score was 2.3 ± 1.6 in the male group; while 2.4 ± 1.9 in the female group. The ADL score was higher in the male group (2 ± 2.3) than in the female group (1.6 ± 2.08). Finally, the IADL score was lower in the male group (2 ± 1.45) than in the female group (3.7 ± 3.5).

Correlations between the ISAR index and the ADL and the IADL scores were all statistical significant (p<0.05 and p<0.001) as shown in (Figures 1-4).

**DISCUSSION**

This study demonstrates a significant relationship between performance of daily living activities and the ISAR score.

By considering the ISAR score, it could be used as a standardized addendum to clinical decision-making and recording or as an indicator of case mix for service monitoring purposes, or in stratification and selection process for patients in clinical trials. Given the limitation of such tools, further work will be required to devise a simple, clinically acceptable process to identify high risk patients [7]. Previous research shows that cognitive functioning is the strongest predictor of functional impairment. Although

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**Figure 1** Correlations between ISAR score and ADL score in the male group.
However, only a limited number of studies focus on the outcome of the elderly functional decline. In fact, more studies focus on nursing home admission, length of stay, mortality and other adverse outcomes [9, 10]. Outcomes like nursing home admission are also dependent on other cultural and social variables like the availability of placements in a nursing home, consequences of living alone and the wishes of the patient and the family. In those studies functional decline is one of the predictors of these adverse outcomes. Measuring the predictors of adverse outcomes is an indirect way to measure functional decline and these outcomes may share some of the predictors of functional decline. It is important to notice that findings of these studies are concurrent with the most important predictors of functional decline in this study [11].

The ISAR with the ADL and the IADL score seem to be positively correlated and to provide a valid proxy measure for assessing functional status in older patients. Moreover, it will be useful in identifying the elderly population at high risk. This simple tool will be very useful in the geriatric nursing practice to develop nursing pathways used in the elderly evaluation, in order to standardized nursing care organization. Several studies will occur to develop a statistical valid correlation coefficient index between the ISAR score and the ADL and IADL indexes.

REFERENCES


