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Taylor K. Long

Stephanie D. Booza-Gierman

Lauren Turner

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Outcomes Associated with Using the Identification of Seniors at Risk (ISAR) Score to Determine Geriatric Evaluations of Trauma Patients with Hip Fractures

Taylor Long DNP, AGCNS-BC, Stephanie Booza MSN, RN, & Lauren Turner BS
Henry Ford Macomb Hospital



HENRY FORD MACOMB HOSPITAL

BACKGROUND

- Falls are a leading cause of injury in older adults in the U.S., commonly contributing to hip fractures specifically (Centers for Disease Control, 2016; Moreland, Kakara, & Henry, 2020).
- Many older adults who sustain a hip fracture will not return to their baseline function and may even require nursing home placement for additional care (Rubenstein & Josephson, 2006).
- Henry Ford Macomb Hospital (HFMH) is a community teaching hospital with Level II Adult Trauma designation.
- In 2013, the Trauma Quality Improvement Program (TQIP) stressed the need for specialized geriatric care (American College of Surgeons, 2013, p.5).
- Falls with hip fracture accounted for 15% of Trauma admissions in 2014-2016 and 21% in 2017-2019 at HFMH.
- In 2016, the Identification of Seniors at Risk (ISAR) screening tool was utilized for Trauma patients 60 years and older to help capture their need for a Geriatric evaluation. It is completed by a Trauma Resident upon evaluation of the patient in the Emergency Department. A Geriatric evaluation is recommended if the patient answered “yes” to two or more questions on the screening tool. If a patient is discharged prior to being seen for the evaluation, follow up information is encouraged to be provided for the Geriatric outpatient clinic.

Identification of Seniors at Risk (ISAR)

If the response to two or more of the following questions is “yes,” Geriatric consultation should be obtained.

- Before you were injured, did you need someone to help you on a regular basis?
- Since the injury, have you needed more help than usual to take care of yourself?
- Have you been hospitalized for one or more nights during the past six months?
- In general, do you have problems seeing well?
- In general, do you have serious problems with your memory?
- Do you take more than three medications every day?

AIM

- To evaluate outcomes of older adults who sustained a hip fracture after falling as related to the implementation of the ISAR tool to determine Geriatric evaluations and assess outcomes related to individual ISAR scores (0-6).

METHODOLOGY

Design

Retrospective program evaluation conducted via chart review.
July 1, 2014-June 30, 2016, and January 1, 2017, to December 31, 2019.

Setting/Sample

- Inclusion criteria
- Patients ages 60 years and older
 - Admitted for a hip fracture.
 - Admitted to trauma service

Variables

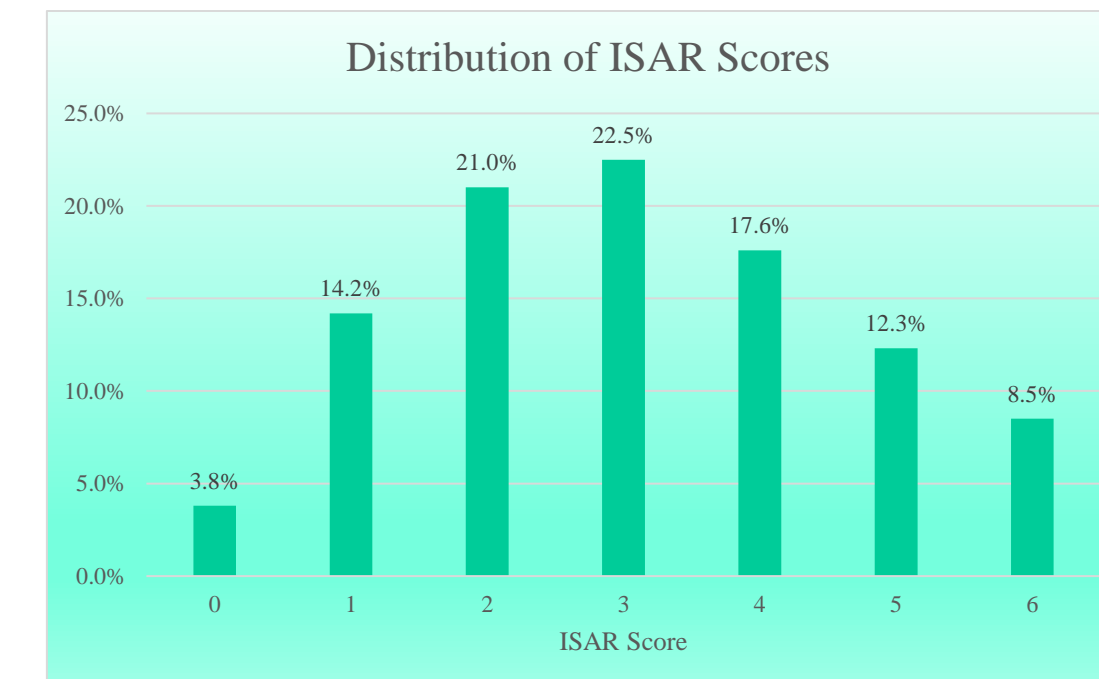
ISAR score (0-6 or if incomplete/not completed)	Presence of a Geriatric evaluation
Injury Severity Score (ISS)	Discharge disposition
Presence of a hospice consult	In-hospital mortality
Length of stay (LOS)	30-day hospital readmission
Demographics: gender, race, age, ethnicity, and language.	Intensive Care Unit LOS

Data Analysis

Variables were described using standard summary measures such as means and standard deviation for continuous variables and counts/percentage for nominal data. Continuous variables that did not follow a normal distribution were described via medians and interquartile ranges. The two groups were compared with Student’s t-Tests and Chi-squared tests dependent on variables. To evaluate variables related to each ISAR score, Kruskal-Wallis analysis was used. The p-value was adjusted as needed to conclude significance using Hochberg’s adjustment.

RESULTS

- A total of 1,142 charts were reviewed. Thirty-six were excluded for admission to non-trauma service, and an additional forty-six charts were excluded for patients with multiple admissions. Of the qualifying patients, 380 were included in our pre-Geriatric evaluation implementation and 680 in post.



- In the post period, 48/680= 7% patients did not have an ISAR completed.
- Many of the patients admitted to the Trauma Service with hip fractures sustained an intertrochanteric fracture, followed by proximal femur fracture and then femur shaft fracture.
- Majority of Trauma patients sustaining a hip fracture were white, non-Hispanic, English-speaking, Caucasian females.

Outcomes Compared By ISAR Score (Table 1)

- There is a significant difference in age between each ISAR score (p=0.001), with generally higher ISAR scores as age increases.
- The ISS does not correlate with increasing ISAR score (p=0.102).
- Length of stay increases with ISAR scores (p=0.012).
- The longest duration of ICU stays occurred in patient with an ISAR score of three.
- In-hospital mortality did not increase with increasing ISAR score (p=0.664). In-hospital mortality was highest in ISAR scores of five.
- Readmissions were highest in those with an ISAR score of five, and an ISAR score of one had the lowest rate of readmission.
- Hospice was consulted more frequently as the ISAR score increases (p=0.034), with the highest prevalence of consults noted in patients with ISARs of six.
- Majority of patients were discharged to SNF regardless of ISAR score (p=0.092).

Outcomes Compared Before and After Geriatric Evaluation (Table 2)

- Of the 680 patients in the post-group, 434 patients received a Geriatric Evaluation.
- Age and ISS was significantly higher in the Geriatric evaluation population.
- No significant difference was found between total LOS, though did decrease by four hours (p=0.075).
- In the pre-group, more patients were admitted to the ICU (5.78%) than the post-group (4.14%); however, the pre-group had a shorter ICU length of stay (5.73 vs 5.89, P = 0.847).
- Thirty-day readmissions trended higher in the post-group with a Geriatric evaluation (p=0.106).
- In-hospital mortality was lower in the post-group with a Geriatric evaluation (p=0.243).
- Hospice consults and discharges to Hospice were higher in the post-group with a Geriatric evaluation (p=0.083).
- Majority of patients were discharged to a Skilled Nursing Facility (SNF) for both the pre- and post-group, followed by home with services, or home with self-care.
- Discharge to inpatient rehabilitation unit (IPR) decreased in the post-group with a Geriatric evaluation.

Table 1: Outcomes by ISAR Score

ISAR	Participants (N)	Mean Age (in years)	Mean ISS	Mean LOS in hours	Mean ICU LOS in days	Inpatient Mortality	Readmissions	Hospice Consults	Discharge to SNF
0	3.8% (24/632)	76.5	9.21	98	3.00	0% (0/24)	0% (0/24)	0% (0/24)	66.7% (16/24)
1	14.2% (90/632)	78.0	9.20	104	2.00	1.11% (1/90)	6.67% (6/90)	0% (0/90)	78.9% (71/90)
2	21% (133/632)	81.2	9.33	124	3.00	0.75% (1/133)	12.78% (17/133)	0.75% (1/133)	89.5% (119/133)
3	22.5% (142/632)	81.8	9.42	132	7.18	0.7% (1/142)	11.97% (17/142)	2.11% (3/142)	79.6% (113/142)
4	17.6% (111/632)	83.1	9.41	117	3.75	0% (0/111)	14.41% (16/111)	4.50% (5/111)	77.5% (86/111)
5	12.3% (78/632)	86.0	9.35	122	2.50	2.56% (2/78)	17.95% (14/78)	1.28% (1/78)	82.1% (64/78)
6	8.5% (54/632)	84.7	9.72	142	4.00	1.85% (1/54)	12.96% (7/54)	7.41% (4/54)	81.5% (44/54)
Overall P-value		0.001	0.102	0.012	0.642	0.664	0.413	0.034	0.092

Table 2: Outcomes With & Without a Geriatric Evaluation

	Pre			Post with Geriatric Evaluation			
Variable	N	Mean	SD	N	Mean	SD	P-value
Age	380	82.06	9.51	434	83.64	8.69	0.026
ISS	380	9.22	0.69	434	9.38	0.92	0.001
LOS (Hours)	380	136.49	67.09	434	132.53	69.06	0.075
ICU LOS (Days)	22	5.73	5.37	18	5.89	5.03	0.847
		%			%		
30-day Readmissions		10.53(40/380)			14.29(62/434)		0.106
Hospice Consults		1.05 (4/380)			3.00 (13/434)		0.083
In-Hospital Mortality		2.11 (8/380)			0.92 (4/434)		0.243

DISCUSSION

- To the existing body of literature, this current study adds outcomes broken down by each individual ISAR score for patients with hip fractures and the associated outcomes using the ISAR score to guide the need for Geriatric evaluations.
- The ISS does not correlate with increasing ISAR score (p=0.102). It could be suggested that the individual questions that make up the ISAR score do not address the severity and/or mechanism of injury.
- The longest ICU LOS occurred in patients with an ISAR score of three; however, the ISAR screening tool was not originally developed to predict ICU stays. There is limited literature to support this finding and more research could be done in this area.
- With 30-day readmissions being the highest in those with an ISAR scores of four and five, quality and care coordination efforts could be directed towards Geriatric Trauma patients with these scores.
- Patients with a Geriatric evaluation, who were older and scored a higher ISS, had a shorter LOS by approximately four hours, this is vital because it can be associated with decreased costs and increased patient satisfaction.
- Admissions to Inpatient Rehab (IPR) decreased in the post-group, further investigation could assist with determining causal factors, though IPR admissions are typically low due to requiring a physical and medical need for admission.
- In-hospital mortality decreased in the post group, even with increased age and ISS. There are inconsistencies among current studies regarding the mortality of Trauma patients after undergoing a Geriatric evaluation, therefore more research is needed to fully understand the impact.

LIMITATIONS

- More rigorous research design would be beneficial to fully understand the studied outcomes.
- The six-month period during which the Geriatric evaluation service was in the early stages of development and planning the use of the ISAR score was not included in the study time frame.
- The ISAR score can be challenging to obtain due to altered mental status or lack of family/surrogate presence to obtain accurate information at the time of screening.
- This study also did not verify the accuracy of the scores obtained by the Trauma Resident. This could impact the outcomes associated with each ISAR score in addition to the outcomes related to patients that received Geriatric evaluations.
- Compliance of the Trauma Service in following the recommendations as well as patients and family’s adherence to the plan of care may impact outcomes. In addition, this study did not address what specifically is included in a Geriatric evaluation. It also may have been helpful to know which individual ISAR questions are most often answered “yes” to validate if the specific concerns were addressed during the evaluation.

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