Identifying Adverse Events after Discharge from a Community Hospital

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Background

Adverse events (AEs) are injuries caused by medical management rather than the patient's underlying disease or condition. AEs that occur after discharge from the hospital have recently become a major public health concern. The only two existing studies that identified post-discharge AEs did not specifically examine an older population. Factors identified in older outpatients or complex patients during transitions from the hospital suggest factors such as poor therapeutic monitoring and prescriptions from various providers, which lead to an incomplete medication picture. We present preliminary results, from a recently funded R01 AHRQ grant, on the frequency of adverse events that occur after hospital discharge in patients aged 65 and older, and compare results with patients younger than age 65.

Methods

Adult patients in this prospective cohort study were selected by nurse interviewers from hospital discharges over 12 months. The Tallahassee Memorial Hospital (TMH) is a regional community hospital servicing both urban and rural patients. Exclusion criteria included a discharge to a skilled nursing facility. Study participants were screened by two study nurses using a structured telephone interview approximately 3-weeks after discharge from the hospital. Possible AEs were sent to two physician reviewers based on three explicit criteria: (1) new or exacerbated symptoms; (2) unplanned health services utilization; and (3) abnormal laboratory test. AEs were determined by performing an independent implicit health record review (both inpatient and outpatient). Physicians reviewed the records provided to determine AEs independently and which AEs resulted from drugs (ADEs) versus other causes. AEs were classified as preventable, ameliorable, non-preventable/non-ameliorable as well as their severity. Severity was determined by effect on activities of daily living (ADLs). Disagreements were resolved by consensus. Drug names/ classes were recorded by physicians. Subsequently, it was determined which drugs were Beers list drugs.

The project recruited 607 patients. Of these, 477 patient charts have been fully adjudicated: 258 less than age 65, 126 ages 65-74, and 93 greater than 75.

We stratified frequencies by age group: 1) ADEs versus other causes, 2) preventable versus non-preventable versus ameliorable, 3) four common drug classes, 4) Beers list drugs, 5) health services utilization (readmissions, ER visits, and contact/visit with MD or lab), 6) severity of injury.

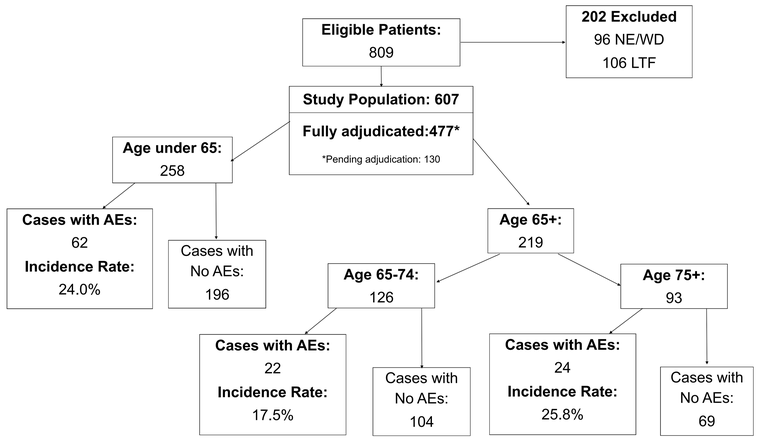
Results

Type of Injury and Incidence of AEs, Preventable AEs, and Ameliorable AEs*

Type of Adverse Event	Patients	All Events	Adverse Drug Events	Other Errors
<----------n(%)---------->				
Total	108	166	115 (69.3%)	51 (30.7%)
Preventable	49 (45.4%)	58 (34.9%)	32 (27.8%)	26 (50.9%)
Ameliorable	46 (42.5%)	57 (34.3%)	45 (39.1%)	12 (23.5%)
Age <65	24.0% (n=62)	99	66	33
Preventable	28	33	16	17
Ameliorable	27	35	27	8
Age 65-74	17.5% (n=22)	30	23	7
Preventable	10	11	6	5
Ameliorable	9	12	11	1
Age 75+	25.8% (n=24)	37	26	11
Preventable	11	14	10	4
Ameliorable	10	10	7	3

*One hundred sixty-six AEs occurred in 108 patients (62 patients were under age 65, 22 aged 65-75, and 24 over age 75). Fifty-eight AEs in forty-nine patients were preventable (28 of these patients were under 65, 10 were aged 65-74, and 11 were over 75). Fifty-seven AEs in 46 patients were ameliorable (where 27 patients were under 65, 9 were aged 65-74, and 10 were over age 75). The number of AEs across each row exceeds the number of patients with AEs because patients could have had more than one AE. Additionally, for ease of

Results Cont'd



Study Population: Completed the interview or returned to the hospital (Emergency Department or were readmitted) within 3-4 weeks of the index hospitalization without completing the interview.

Excluded: Voluntarily withdrew (WD) from study, became ineligible (NE) at time of discharge, or were lost to follow up (LTF).

Fully Adjudicated: Cases reviewed by the physicians and were categorized as having an AE or not. It also includes cases that were determine by the study nurses to not have a possible AE. These cases went under a secondary review. Some were referred to a physician to review, if they met criteria on the basis of outpatient records.

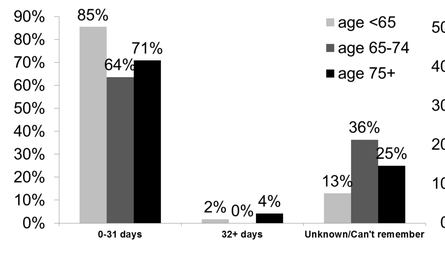
AEs: Adverse Events.

Prev: Preventable AEs - an injury that could have been avoided as a result of an error or system design flaw.

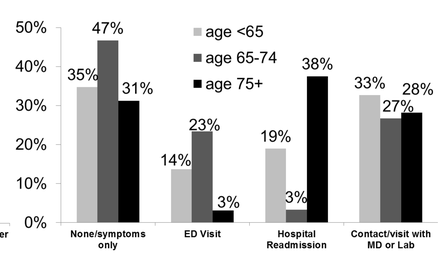
Amel: Ameliorable AEs - an injury whose severity or duration could have been substantially reduced if different actions or procedures were performed or followed.

Cases with No AEs: Cases that were adjudicated as negative for AEs by the physicians and were not flagged for having a possible AE by study nurses.

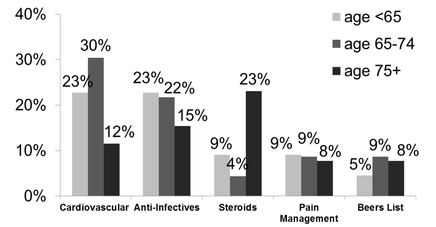
Days between Discharge and First Follow-up Appointment for Patients with Adverse Events (n=108)



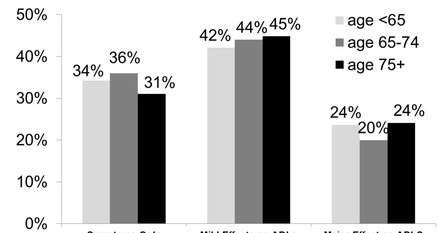
Health Service Utilization of Patients with Adverse Events (n=108)



Medication Classes for Patients with Adverse Drug Events (n=115)



Severity of Injuries for Patients with AEs (n=108)



Conclusions

1. Preliminary data suggest a 30-day post-discharge AE and ADE rate comparable to previous studies, 1/3 preventable and 1/3 ameliorable.
2. AE rates were slightly higher for the oldest old (75+) when compared to younger patients.
3. The vast majority of all patients with AEs were seen within 30 days of discharge.
4. As in other studies, ADEs are the most common type of AEs. Drug classes do not differ by age.
5. Approximately 1 in 4 patients with AEs experience major effects on ADLs independent of age.
6. The overall percentage of Beers list drugs involved in ADEs is small (<10%), even in the oldest old >75.

Implications

1. Young and older patients experience ADEs at similar rates. This raises the question of comorbidity burden.
2. Strategies supplementing Beers criteria are needed to identify the majority of potential adverse drug events.
3. Analysis is needed in patients with AEs to determine what factors are associated with impact on daily activities.

References

Gurwitz JH, Field TS, Harrold LR, Rothschild J, Debellis K, Seger AC, Cadoret C, Fish LS, Garber L, Kelleher M, Bates DW. Incidence and preventability of adverse drug events among older persons in the ambulatory setting. JAMA. 2003 Mar 5;289(9):1107-16.

Coleman, EA. Falling through the cracks: challenges and opportunities for improving transitional care for persons with continuous complex care needs. J Am Geriatr Soc 2003; 51(4):549-555

American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American geriatrics Society Updated Beers Criteria for Potentially Inappropriate Medication Use in the Older Adults. J Am Geriatr Soc 29-12; 60(4):616-31.

Forster, AJ, Murff HJ, Peterson JF, Gandhi TK, Bates DW. The Incidence and Severity of Adverse Events Affecting Patients after Discharge from the Hospital. Annals of Internal Medicine 2003; 138(3): 161-167.

Forster AJ, Clark HD, Menard A, Dupuis N, Chernish R, Chandok N, Khan A, van Walraven C. Adverse Events among Medical Patients after Discharge from Hospital. Canadian Medical Association J 20044; 170 (3): 345-349.