



in the post-sign off period: a retrospective cohort study

Hitoshi Honda M.D., PhD, Akane Takamatsu, M.D.

Department of Infectious Diseases, Fujita Health University School of Medicine, Aichi Japan

Department of Microbiology, Juntendo University Graduate School of Medicine Tokyo, Japan

Contact : Hitoshi Honda, M.D.
Department of Infectious Diseases, Fujita Health University School of Medicine
Email: hhhonda@gmail.com or hitoshi.honda@fujita-hu.ac.jp

REVISED ABSTRACT

Background

Infectious diseases (ID) consultation has contributed to improving outcomes in hospitalized patients. However, the timing of signing off on ID consultation varies, depending on the consulting ID physician. The present study aimed to scrutinize the descriptive epidemiology of treatment-related adverse events occurring after the ID physician has signed off on consultation and the epidemiology and predictors of non-adherence to ID recommendations in the post-sign off period.

Methods

The present, retrospective cohort study was conducted at a Japanese tertiary care center. All patients who received ID consultation between January and December 2019 and treatment recommendations for a confirmed or suspected infectious disease were included. The incidence of any treatment-related adverse events after signing off, non-adherence to the final ID recommendations, and factors associated with non-adherence to the ID recommendations were identified.

Results

In total, 367 patients receiving ID consultation were included. The incidence of post-sign off events during index hospitalization was 16.1% (59/367), with antimicrobial-associated ADEs and HAIs accounting for 44.1% (26/59) and 22.0% (13/59) of the events, respectively. After an ID physician signed off, 16 patients (27.1%, 16/59) discontinued treatment before the end of the recommended treatment period. After excluding patients who discontinued treatment, non-adherence to ID recommendations was found in 55/351 (15.7%) patients. Newly acquired HAIs during the index hospitalization after signing-off on ID consultation was an independent risk factor of non-adherence to ID recommendations (adjusted odds ratio: 3.78; 95% confidence interval: 1.14–12.52).

Conclusions

The post-sign off events were common and led to non-adherence to ID recommendations during the post-sign off period. Because this non-adherence stems from various reasons, patients may require continued attention after the sign off to ensure their continued safety.

INTRODUCTION

- Infectious diseases (ID) consultation has contributed to reducing inappropriate antimicrobial prescriptions and has thereby improved patient outcomes.
- Signing off is done at the discretion of each ID consultant, and its optimal timing remains unclear.
- The present study aimed to scrutinize the clinical course of patients after ID consultants signed off, including additional antimicrobial use and in-hospital complications related to antimicrobial use, such as antimicrobial-associated ADEs and HAIs, and the epidemiology and predictors of non-adherence to ID recommendations after the termination of consultation.

METHODS

- The present, retrospective cohort study was conducted from January 2019 to December 2019 at Tokyo Metropolitan Tama Medical Center, a 790-bed tertiary care center with 34 subspecialties, including a Division of Infectious Diseases.
- Patients who received ID consultation or treatment recommendations for a confirmed or suspected infection were enrolled.
- The exclusion criteria were (i) outpatients, (ii) curbside consultations (i.e., telephone consultation), (iii) cases in which an ID consultant recommended discontinuation of antimicrobial therapy as the final recommendation, and (iv) cases in which an ID consultant recommended the use of specific antimicrobials without specifying the treatment period as the final recommendation.
- Data on patient demographics, antimicrobial allergy, preexisting medical conditions, length of hospital stay (LHS), status at discharge, consultants' specialty, the reason for ID consultation, date of ID consultation and signing off, infectious disease diagnosis, antimicrobial use, and post-sign off events during the treatment of an established infection (i.e., treatment failure, antimicrobial-associated ADEs, HAIs, withdrawal of care, ID re-consultation) were collected.
- Multivariate logistic regression was performed to predict the factors associated with non-adherence to ID recommendations.

RESULTS

Post-sign-off events and outcomes for the patients included in the study

Variables	Total (n = 367)
Post-sign-off events	
No events occurred	308 (83.9)
Antimicrobial-associated adverse drug events occurred	26 (7.1)
Development of new HAI	13 (3.5)
Treatment failure of established infection	4 (1.1)
Withdrawal of care	16 (4.4)
ID re-consultation after sign-off of ID consultation	44 (12.0)
Reason for ID re-consultation (n = 44)	
Antimicrobial-associated adverse drug events	22/44 (50.0)
Development of new HAI	9/44 (20.5)
Requirement of changing management of established infection	7/44 (15.9)
Treatment failure of established infection	4/44 (9.1)
Non-infection and non-antimicrobial-associated adverse drug events	2/44 (4.6)
Outcomes	
Status at discharge	
Discharge home	230 (62.7)
Discharge nursing home	11 (3.0)
Transferred-out to other non-acute care hospitals	91 (24.8)
Transferred-out to other acute care hospitals	5 (1.4)
Deceased	30 (8.2)
Length of ID consultation, median, (IQR), days	8 (5-12)
Length from ID consultation sign-off to discharge, (IQR), days	13 (5-30)
Length of hospital stay, median, (IQR), days	30 (15-48)

RESULTS

- During the study period, among 740 patients receiving ID consultation, 367 meeting the inclusion criteria were analyzed.
- Post-sign off events occurred in 59 patients (16.1%, 59/367); antimicrobial-associated ADEs and HAIs accounted for 44.1% (26/59) and 22.0% (13/59) of the cases, respectively.
- Non-adherence to ID recommendations was seen in 55 patients (15.7%, 55/351). Twenty-five patients (45.5%, 25/55) discontinued antimicrobial therapy before the recommended date, the most common reason being patient transfer or discharge (18.2%, 10/55). Meanwhile, 30 patients (54.5%, 30/55) continued their antimicrobial therapy.

RESULTS

Variables	Nonadherence (n = 55)	Adherence (n = 296)	Crude OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Patient demographics						
Age > 65	40 (72.7)	178 (60.1)	1.77 (0.93-3.34)	0.080	1.83 (0.94-3.57)	0.077
Male sex	29 (52.7)	160 (54.1)	0.95 (0.53-1.69)	0.856		
Comorbidities						
Charlson comorbidity index score, median, (IQR)	3 (1-4)	2 (0-4)	1.04 (0.93-1.17)	0.474		
Chronic lung disease	7 (12.7)	26 (8.8)	1.51 (0.62-3.69)	0.360		
Diabetes mellitus	10 (18.2)	64 (21.6)	0.81 (0.38-1.69)	0.566		
Liver disease	13 (23.6)	46 (15.5)	1.68 (0.84-3.38)	0.144		
Any malignancies	12 (21.8)	55 (18.6)	1.11 (0.78-1.57)	0.575		
Clinical characteristics at ID consultation						
Department						
Critical care medicine	4 (7.3)	39 (13.2)	Ref.		Ref.	
Surgery	28 (50.9)	152 (51.4)	1.80 (0.59-5.42)	0.299	1.99 (0.65-6.11)	0.232
Medicine	22 (40.0)	101 (34.1)	2.12 (0.69-6.56)	0.190	2.02 (0.64-6.31)	0.229
Other	1 (1.8)	4 (1.4)	2.44 (0.22-27.44)	0.471	4.24 (0.35-50.93)	0.255
Reason for ID consultation						
Management of documented ID	27 (49.1)	175 (59.1)	Ref.			
Management or diagnosis of presumed ID	28 (50.9)	114 (38.5)	1.59 (0.89-2.84)	0.115		
Diagnosis made by ID team						
Bloodstream infection/Endovascular infection	17 (30.9)	101 (34.1)	0.86 (0.46-1.61)	0.643		
Lower respiratory infection	2 (3.6)	16 (5.4)	0.66 (0.15-2.96)	0.587		
Intraabdominal infection/Hepatobiliary infection	6 (10.9)	32 (10.8)	1.01 (0.40-2.54)	0.983		
Osteoarticular infection	12 (21.8)	43 (14.5)	1.64 (0.80-3.36)	0.175		
Urinary tract infection	4 (7.3)	28 (9.5)	0.75 (0.25-2.23)	0.606		
SSTI/NSTI	3 (5.5)	17 (5.7)	0.95 (0.27-3.35)	0.932		
Sepsis unknown origin/ Febrile neutropenia	2 (3.6)	3 (1.0)	3.69 (0.60-22.59)	0.158		
SSI	2 (3.6)	11 (3.7)	0.98 (0.21-4.54)	0.977		
Post sign-off events						
Treatment failure of established infection	2 (3.6)	2 (0.7)	5.55 (0.76-40.24)	0.090	5.40 (0.72-40.21)	0.100
Antimicrobial-associated adverse drug events occurred	4 (7.3)	22 (7.4)	0.98 (0.32-2.95)	0.967	1.14 (0.37-3.50)	0.819
Development of new HAI	5 (9.1)	8 (2.7)	3.6 (1.13-11.45)	0.030	3.78 (1.14-12.52)	0.030

CONCLUSIONS

- Despite the treatment recommendations made by ID physicians, antimicrobial therapy was sometimes modified by treating physicians following sign-out by the ID physicians.
- In-hospital, antimicrobial treatment-related adverse events commonly occur during the sign off period, leading to non-adherence to treatment recommendations made by ID physicians.
- Since non-adherence during this period can have a detrimental effect on patients' safety and outcomes, ID physicians should make clear to the attending physicians that consultation will still be available even after signing off.