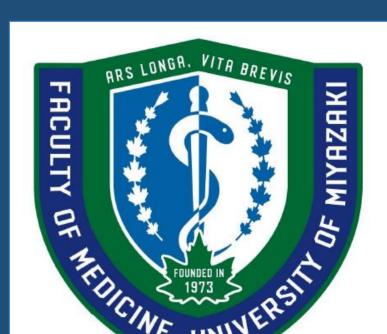
Utilization of Stepwise Initial Therapy Evaluation by AST Pharmacists for Appropriate Vancomycin Use Yasutoshi Hirabara^{a, b*}, Ryota Habu^{a, b}, Yuki Rikitake^{b, c}, Chihiro Iwao^{b, c}, Akiko

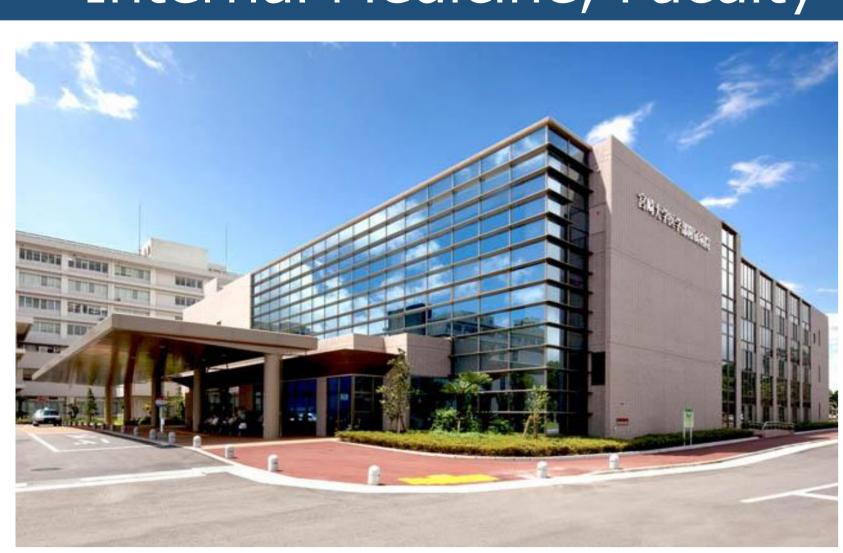
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University of Miyazaki Hospital

Location: Kiyotake, Miyazaki City, JAPAN Number of beds: 604

Number of staff: 1,472 (as of April 1, 2024)

Average number of inpatients: 488.6 per day (2024) Average number of outpatients: 1,095.9 per day (2024)

Average length of hospital stay: 12.6 days (2024) **Bed occupancy rate:** 80.9% (2024)

Facility standard: Infection Control Enhancement Fee I



Center for Infection Control (CIC)

Physicians: 3 Nurses: 2 Pharmacists: 2

* (including 1 full-time AST member)

Clinical Microbiology Technologist: 1

Clerical staff: 1

Background

Our hospital has promoted antimicrobial stewardship (AS) by revising antibiotic notification forms and conducting in-hospital conferences. To further improve AS and standardize vancomycin use, a stepwise assessment by antimicrobial stewardship team (AST) pharmacists was introduced at the start of therapy.

Objective

This study aimed to clarify appropriate indications for vancomycin use and enhance collaboration between pharmacists and physicians through initial evaluation.

Methods

From January to December 2024, 311 patients administered vancomycin were classified using a five-step assessment. Evaluations from January to June (preintervention) were retrospective; those from July to December (post-intervention) were prospective.

Process indicators such as days of therapy, rate of culture specimen submission, therapeutic drug monitoring, and duration of antimicrobial administration were compared.

Among the categories in the table on the right, I and II were judged as appropriate use, while **III** to **V** were judged as inappropriate use.

Stepwise Initial Therapy Evaluation for Vancomycin

- agreement with use
 - •Infection with Gram-positive bacteria resistant to β-lactams (e.g., MRSA, MRSE)
 - •Severe infections requiring MRSA coverage, such as septic shock
 - •History of MRSA detection, indicating need for coverage
 - •Suspected infection caused by Gram-positive bacteria (e.g., Enterococcus faecium) •Judged more severe than indicated by SOFA score
- I agreement with agent but dose adjustment needed III need to confirm necessity of MRSA coverage
- IV pathogen already identified
- V no cultures or unclear indication

1) Open Forum Infect Dis 2018 22;5(12):314

Results & Discussion

1: five-step assessment

five-step assessment	Pre- intervention		Post- intervention	
	Cases	%	Cases	%
I. agreement with use	120	79.5	127	79.4
I. agreement with agent but dose adjustment needed	8	5.3	10	6.3
II. need to confirm necessity of MRSA coverage	22	14.6	20	12.5
IV. pathogen already identified	1	0.7	3	1.9
V. no cultures or unclear indication	0	0	0	0

> The five-step evaluation distribution remained unchanged pre- and post-intervention.

2: Comparison of process indicators before and after the intervention

		Pre- intervention	Post- intervention
	lumber of patients dministered	151	160
tl	tate of herapeutic drug nonitoring (%)	98.5	96.2
	ate of culture ubmission (%)	99.3	98.8
D	OT (100bd)	1.48	1.40
a	uration of ntimicrobial dministration days)	8.68	8.67

> Process indicators remained unchanged pre- and post-intervention.

3: Five-step evaluation and duration of administration

duration of administration

		Cases	≦7 days			8–14 days		≥15 days	
Pre- interven		151	57.6%		29.1%		13.2%		
Post- interven		160	60	.6%	6% 21.3%		18.1%		
Appropriate use I, II (Post-intervention) In-appropriate use II~V (Post-intervention)									
duration	Case (n=13		%	duration		Cases (n=23)		%	
≦7 days	77	5	6.2	≦ 7 c	days	20		87.0	
8-14 days	34	2	4.8	8- da		0		0	
≥15 davs	26	3	3.8	≥15 days		3		13.0	

> Among the cases judged as inappropriate, 87% were completed within 7 days, allowing early collaboration with the relevant departments for cases where vancomycin use was unnecessary or the causative pathogen had been identified.

4: Infection at the start of therapy after the intervention

Infection	Appropriate use I, II (N=137)	Inappropriate use □~V (N=23)
Bloodstream infection	39	4
Respiratory infection	36	13
Urinary tract infection	4	0
Skin and soft tissue infection	11	3
Central nervous system infection	7	0
Gastrointestinal infection	3	0
Bone and joint infection	5	0
Surgical site infection	5	0
Febrile neutropenia	10	2
Others	17	1

> Most of the cases judged as inappropriate were respiratory infections, and they were concentrated in certain departments. Going forward, appropriate use of anti-MRSA agents for respiratory infections in the target departments remains a challenge.

of vocativatous infactions induced as inconsucations

5: 13 cases of respiratory infections judged as inappropriate						
Resp. infections	Sputum culture smear	GECKLER	qSOFA	Isolated pathogen		
CAP	polymicrobial	1	2	Commensals		
VAP	GNR	5	SOFA6	P .aeruginosa		
HAP	polymicrobial	3	1	K. variicola MSSA		
HAP	polymicrobial	2	2	Commensals		
CAP	none	6	1	Not detected		
HAP	polymicrobial	3	0	MSSA		
HAP	polymicrobial	3	1	<i>K. oxytoca、E. coli、</i> MSSA		
HAP	polymicrobial	3	1	K. aerogeness、MSSA、 S. maltophilia		
HAP	polymicrobial	5	0	E. cloacae complex Commensals		
CAP	polymicrobial	1	1	Commensals		
HAP	GPC	4	1	MSSA		
HAP	GPC、GNR	6	1	P. aeruginosa		
HAP	polymicrobial	3	1	Commensals		
	Resp. infections CAP VAP HAP HAP HAP HAP HAP HAP	Resp. infections CAP polymicrobial VAP GNR HAP polymicrobial HAP polymicrobial CAP none HAP polymicrobial HAP polymicrobial HAP polymicrobial HAP polymicrobial HAP polymicrobial CAP polymicrobial HAP GPC HAP GPC, GNR	Resp. infections smear GECKLER smear CAP polymicrobial 1 VAP GNR 5 HAP polymicrobial 3 HAP polymicrobial 2 CAP none 6 HAP polymicrobial 3 HAP polymicrobial 5 CAP polymicrobial 5 CAP polymicrobial 1 HAP GPC 4 HAP GPC、GNR 6	Resp. infections CAP polymicrobial 1 2 VAP GNR 5 soft 6 HAP polymicrobial 2 2 CAP none 6 1 HAP polymicrobial 3 0 HAP polymicrobial 3 1 HAP polymicrobial 3 1 HAP polymicrobial 3 1 HAP polymicrobial 3 1 HAP GPC 4 1 HAP GPC GNR 6 1		

*CAP:Community-Acquired Pneumonia / HAP:Hospital-Acquired Pneumonia / VAP:Ventilator-Associated Pneumonia

Conclusion

- 1. Support for standardized evaluation
 - The structured, objective assessment enabled standardized evaluation of vancomycin use.
- 2. Enhanced pharmacist-physician collaboration
 - The structured assessment facilitated prioritization of issues requiring collaboration and improved communication.
- 3. Contribution to antimicrobial stewardship activities Stepwise evaluation may serve as an effective tool for advancing AS activities by identifying targets for intervention.