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Introduction

- Early intravenous to oral antibiotics switch (IVOS) is one of the important elements in antimicrobial stewardship (AMS).¹
- Shrayteh *et al* 2014 mentioned that hospitalized patients were prescribed with intravenous antibiotic for longer period while oral route of antibiotic is possible.²
- Currently, the decision on IVOS of antibiotics in Hospital Sibu is based on the decision of clinicians.
- A systematic interventional strategy by pharmacist is required to facilitate IVOS.
- This study aimed to evaluate the **impact of printed AMS recommendations by pharmacist on early IVOS.**

Materials and Methods

Study population	Study design	Sample size
All adult patients receiving IV antibiotics in surgical wards in Sibu Hospital during the study period	A cross-sectional interventional study	128 patients (pre = 64, post = 64)

- 18 years old and above
- Received an IV antibiotic for at least 48 hours
- Body temperature <38°C for the past 24 hours
- Normal or decreasing white cell count
- Tolerating orally
- Showing clinical improvements from signs of infection.

Inclusion criteria

- Oral route compromised
- Continuing sepsis
- Deteriorating clinical condition
- Prolonged course of IV antibiotics needed
- Febrile with neutropenia
- Absence of oral formulation that fit the susceptibility
- Hypotension
- Shock

Exclusion criteria

Patients receiving IV antibiotics for ≥ 48 hours (April - October 2019)

Pre-intervention phase (April- June 2019)

Pharmacists performed the conventional practice of reviewing medication charts without informing prescribers about the IVOS of antibiotics.

Data Collection & Analysis

Post-intervention phase (August- October 2019)

Pharmacists screened the antibiotic prescriptions and intervened by attaching **printed checklist** which contained IVOS criteria to patients' medical notes on the day patients were eligible for the switch. **IVOS stickers** were also applied to the antibiotic prescriptions to serve as reminders.

Data Collection & Analysis

	Pre	Post
No. of patients screened	186	116
Excluded:		
Patients <18 years old	2	1
Oral route compromised	14	12
Continuing sepsis	17	8
Required prolonged IV course	67	24
Febrile with neutropenia	2	1
No suitable oral formulation	4	1
Lost to follow-up/ transfer to other ward/ hospital	12	9
Patient eligible for inclusion	68	60

Results

Characteristics	Pre-intervention	Post-intervention	P value
No. of patients, n	68	60	
No. of IV antibiotic courses, n	91	92	
Gender: n (%)			0.352 ^a
Male	44 (64.7)	34 (56.7)	
Female	24 (35.3)	26 (43.3)	
Age (years): mean (SD)	51.7 (18.91)	50.5 (17.50)	0.731 ^b
Site of infection: n(%)			
Abdomen	34 (50.0)	37 (61.7)	0.579 ^a
Skin & Soft Tissue	9 (13.2)	5 (8.3)	
Urinary Tract	12 (17.7)	8 (13.3)	
Others	13 (19.1)	10 (16.7)	

^aChi-square test for independence

^bIndependent *t* test

Table 4.1 Baseline Characteristics

Primary Outcome: Percentage of IV to Oral Antibiotic Switch on Appropriate Day (Table 4.2)

Variable	Pre-intervention, n (%)	Post-intervention, n (%)	χ^2 statistic ^a (df)	P value ^a
IVOS on Appropriate Day	35 (51.5)	45 (75.0)	7.53 (1)	0.006

^aChi-square test for independence

- The percentage of IVOS of antibiotic on appropriate day was significantly more in post-intervention group (75.0%) compared to pre-intervention group (51.5%) as shown in Table 4.2.

Secondary outcome: Percentage of IV antibiotic switched/stopped only upon discharge, length of hospital stay, antibiotics cost saving (Table 4.3)

Variable	Pre-intervention	Post-intervention	<i>t</i> statistic ^a (df)	χ^2 statistic ^b (df)	P value
Length of hospital stay (day), mean (SD)	7.3 (6.13)	6.6 (6.13)	0.655 (126)		0.514 ^a
IV antibiotics only switched/stopped upon discharged, n (%)	51 (75.0)	28 (46.7)		10.830 (1)	0.001^b
Antibiotics cost saving (RM), mean (SD)	22.0 (34.93)	41.9 (39.50)	-0.3030 (126)		0.003^a

^aIndependent *t* test

^bChi-square test for independence

Discussion/ Conclusion

- Printed AMS recommendations initiated by pharmacists had shown to:
 - improve percentage of IVOS of antibiotic on appropriate day** (Table 4.2)
 - reduce the percentage of IV antibiotic switch only upon discharge** (Table 4.3)
 - increase antibiotic cost savings** (Table 4.3)
- This finding was in accordance with the study by Sze *et al.*, in which the percentage of IVOS of antibiotic on the appropriate day was more in the post-intervention group (88.3%) compared to the pre-intervention group (24.1%).³
- Similar approach was implemented by Dunn *et al.* had reported improvement in the percentage of IVOS of antibiotic on the appropriate day in the post-intervention group (71.7%) compared to pre-intervention group (50.6%).⁴
- It can be incorporated as one of the AMS strategies of the hospitals to encourage early IVOS of antibiotics.

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