THE PHARMACIST'S ROLE IN OPTIMIZING SURGICAL ANTIBACTERIAL PROPHYLAXIS (SAP)

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J01- ANTIBACTERIALS FOR SYSTEMIC USE

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Background and importance

Surgical antibiotic prophylaxis in orthopedic joint arthroplasties is common reason for unnecessary, excessive and irresponsible use of antibiotics (Figure 1).

Aim and objectives

The purpose of this study was to analyze whether the continuous presence of clinical pharmacist on the ward may improve SAP guidelines adherence and clinical outcomes.
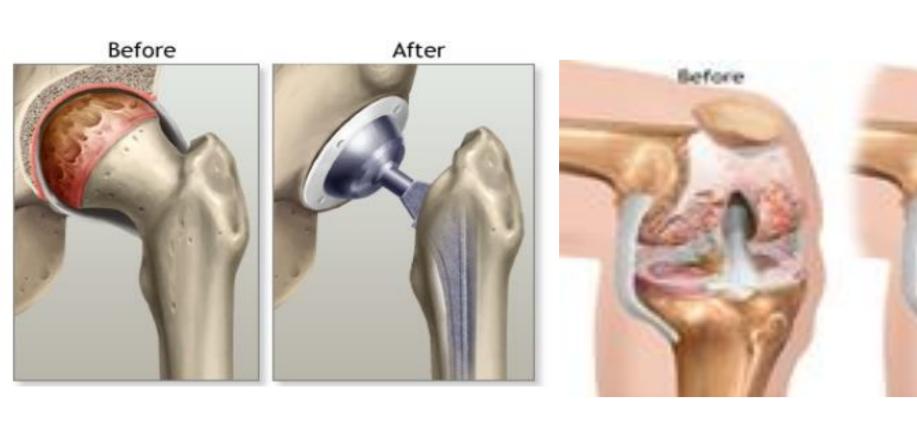

Figure 1: Orthopedic hip and knee joint arthroplasties [1]

Materials and methods

➢ The study was conducted at an Orthopedic Department of a tertiary care medical center (Figure 2).

➢ The clinical pharmacist's interventions consisted of proactively controlling antibiotic prophylaxis every day on an individual level to ensure compliance with SAP (agent, dosage, and duration) guidelines, attending surgical ward visits, participating in antibiotic related decisions, and providing continuous counselling service.

➢ SAP guideline adherence, antibiotic exposure, and costs in the two periods were compared using chi-square, Fisher exact, and Mann-Whitney tests.
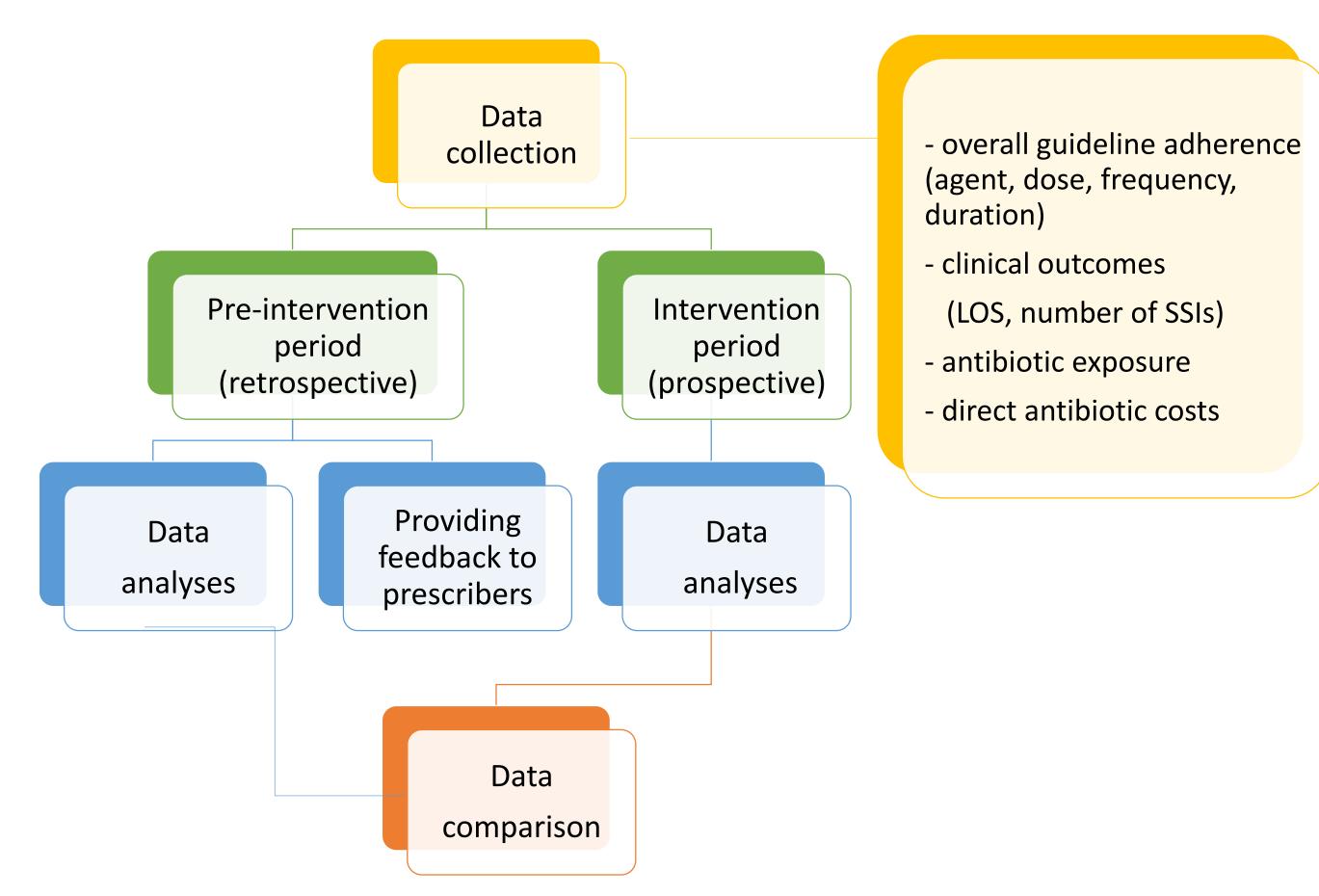

Figure 2: Flow diagram of the pharmacist-led intervention on orthopedic SAP

Parameters	Pre-intervention period N=395 (%)	Intervention period N=182 (%)	Increase /Decrease %	p-values
Guideline-adherent agent(s)	350 (88.6%)	164 (90.1%)	1.5%	n.s.
Guideline-adherent agent, dosage	341 (86.3%)	162 (89%)	2.7%	n. s.
Guideline-adherent agent, dosage, and duration	8 (2%)	106 (58.2%)	56.2%	<0.001
Duration of prophylaxis - days (Median ± SD)	3±2.08	1±1.90	-42.9%	<0.001
One day prophylaxis	9 (2.3%)	113 (62.1%)	59.8%	<0.001
Three days prophylaxis	135 (34.2%)	20 (11%)	-33.2%	<0.001
Over five days prophylaxis	72 (18.2%)	12 (6.6%)	-11.6%	<0.001
Guideline adherent duration	20 (5%)	117 (64.3%)	59.3%	<0.001
Primary arthroplasties	8 (2%)	111 (61%)	59%	<0.001
Revision arthroplasties	12 (3%)	6 (3.3%)	0.3%	n.s.
DDD/patient (Mean ± SD)	6.07 ± 0.05	3.58 ± 4.33	-41%	<0.001
LOS - days (Median ± SD)	9±6.96	7±3.02	-37.2%	<0.001
SSIs onset – days (Median ± SD)	8.91±5.75	8.5±6.61	-3%	n. s
Suspected SSIs	43 (11.6%)	4 (2.3%)	-9.3%	<0.001
Confirmed SSIs	11 (3%)	2 (1.2%)	-1.8%	n. s
Need for postoperative AB treatment due to SSIs	77 (19.5%)	5 (2.7%)	-16.8%	<0.001
Prophylactic AB cost/patient – HUF (Mean ± SD)	9278.8±6094.3	3598.2±3354.6	-54.8%	<0.001
Primary Arthroplasties	8768.7±4478.9	3162.2±2641.7	-56.2%	<0.001
Revision Arthroplasties	17529.0±15852.3	9793.4±6732.1	-50.5%	n. s

Results

Significant improvement in overall SAP guideline adherence, duration, antibiotic exposure, and average prophylactic antibiotic cost were observed.

Moreover, prolonged prophylaxis has no benefit on clinical outcomes (Table 1).

DDD – Daily Defined Dose; SD: standard deviation;
LOS – Length of Stay; AB-antibiotic;
SSIs – Surgical Site Infections;
n.s.: non-significant (p>0.05);

Conclusions

Pharmacist led intervention in SAP → Significant improvement in SAP guideline adherence → Significant reduction of antibiotic exposure, length of stay → Significant reduction of SAP cost

Continuous presence of the clinical pharmacist is crucial in optimizing antibiotic use.

References
Fesus, A., et al., *The Effect of Pharmacist-Led Intervention on Surgical Antibacterial Prophylaxis (SAP) at an Orthopedic Unit.* Antibiotics (Basel), 2021. **10**(12).
[2] https://www.washingtoncircleortho.com/specialties/joint-replacement