

Successful antimicrobial stewardship interventions in a Dutch general hospital



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Introduction

Antimicrobial Stewardship was introduced in 2014 in a Dutch general hospital (14.000 admissions).

The goal was to optimize antimicrobial prescribing in order to improve individual patient care, to decrease the spread of antimicrobial resistance and to reduce adverse events.

Strategies for changing antimicrobial prescribing behavior included education of prescribers regarding the new antimicrobial guidelines and stimulation of the appropriate use of antimicrobial drugs.

The antibiotic team (A-team) aimed to reduce the use of amoxicillin/clavulanic acid, because of the increasing resistance of micro-organisms, and the use of ciprofloxacin. Also, cefazolin was introduced as the new antibiotic prophylaxis in surgery.

Methods

Strategies for changing antimicrobial prescribing behavior included education of prescribers, new antimicrobial guidelines and appropriate use of antimicrobial drugs.

1. The antimicrobial committee created a new antimicrobial formulary with restricted prescribing of antimicrobial agents.
2. The antibiotic team (A-team) was installed in Q1 2014, including an infectious diseases specialist, a hospital based pharmacist and a medical microbiologist. Registration of the interventions started in Q3 2014.
3. The A-team visited all clinical wards twice a week. The A-team aimed to reduce the use of amoxicillin/clavulanic acid and ciprofloxacin in 2015 because of the increasing resistance of micro-organisms. Cefazolin was introduced as the new antibiotic prophylaxis in surgery. The prescribing behavior was measured.

E coli, the most frequent isolate, is used as an indicator for observing change in resistance.

VWB	Dagdosis:	Start:	Stop:	Aantal dagen:
Afdeling: CHIRA				
VWB 1945	V			
Cefazoline injepdr 1000mg	3.000 milligram	intraveneus	9-3-2016	14-3-2016 1,8
VWB 1934	V			
Cefazoline injepdr 1000mg	3.000 milligram	intraveneus	8-3-2016	9-3-2016
Cefuroxim injepdr 1500mg	4.500 milligram	intraveneus	2-3-2016	2-3-2016
Cefuroxim injepdr 1500mg	4.500 milligram	intraveneus	2-3-2016	8-3-2016
Ceftriaxon injepdr 1000mg	2.000 milligram	intraveneus	10-3-2016	0,8

150602M CHO: A-team: Verdenking UWI. Heeft hier katheter gekregen. Kweek uitslag volgt nog
 150605M CHO: A-team: Kweek toont e-coli gevoelig voor alles. Over op amoxil.
 160308I RT A Team: uwi e coli; cath eruit opnieuw 1,5 d; stop; norm prof collum fractuur

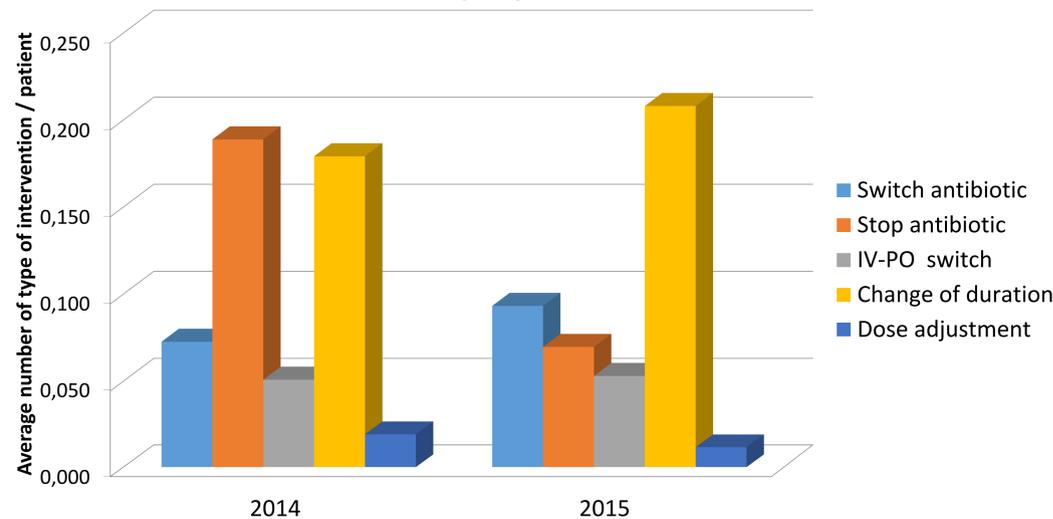
Detail from the "Clinical Rule Antibiotics". An overview generated by the hospital pharmacy and used by the A-team to identify the patients with antibiotic therapy.

Results

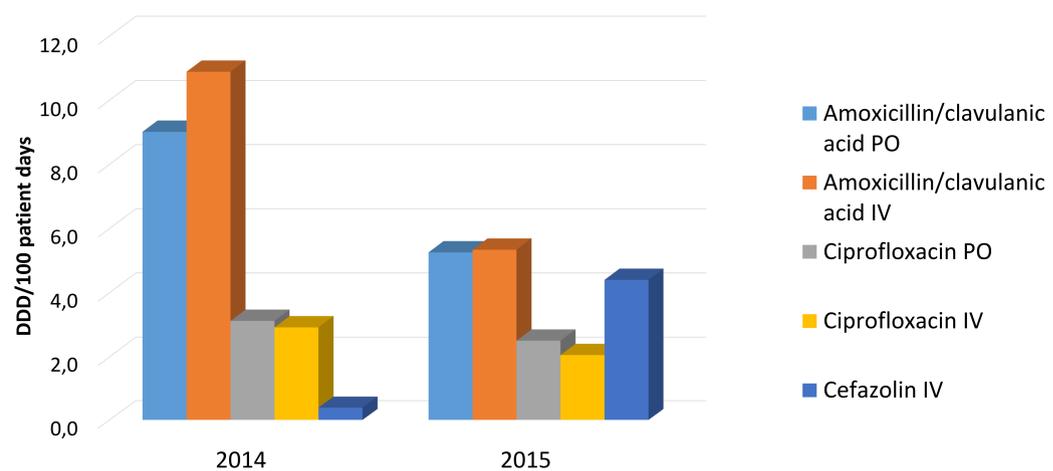
A-team statistics	2014 (Q3-4)	2015 (Q1-4)
Total number of registered A-team meetings	43	69
Total number of interventions	211	444
Total number of discussed patients (mainly internal medicine, orthopaedic and surgery)	413	1019
Average number of interventions per patient	0,51	0,44

Resistance numbers for E-coli isolates per antibiotic	2014	2015
Amoxicillin/clavulanic acid	20,1%	20,4%
Cefuroxime	13,9%	15,3%
Ceftriaxone	7,9%	6,8%
Ciprofloxacin	13,7%	10,9%
Cefazolin	10,4%	9,6%

Distribution of proposed interventions



Antibiotic use



Conclusions

1. The A-team had direct control over antimicrobial use.
2. A change in antimicrobial prescribing behavior and in total use of antibiotics in the hospital was seen following the new formulary and the interventions by the A-team.
3. **The average number of interventions per patient decreased 14,7%.** The "stop antibiotic" intervention decreased 63%. Some intervention increased, signaling a delay in decision making until the A-team visited the ward.
4. A reduction of the amount of amoxicillin/clavulanic acid (42-51%) and ciprofloxacin (20-30%) and increase of the use of preoperative cefazolin (1016%) was seen.
5. The resistance data show no significant change with the exception of ciprofloxacin (reduced from 13.7 to 10.9%).



The A-team