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Implementation of peer comparison reporting and academic detailing sessions to reduce inappropriate antimicrobial prescribing rates in upper respiratory infections among family medicine prescribers

Brian T Burroughs ,[1] Christina Carney,[2] Kelsey Jensen[3]

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[1]Family Medicine, Mayo Clinic Health System in Red Wing, Red Wing, Minnesota, USA
[2]Community Internal Medicine, Mayo Clinic Health System in Red Wing, Red Wing, Minnesota, USA
[3]Pharmacy, Mayo Clinic Health System Austin, Austin, Minnesota, USA

Correspondence to
Mr Brian T Burroughs;
burroughs.brian@mayo.edu

BACKGROUND

Unnecessary antimicrobial prescribing in upper respiratory infections (URI) is common and remains a focus of antimicrobial stewardship programmes (ASP).[1 2] Multiple studies have employed peer comparison data dissemination and clinician education as components of a multimodal approach to improve antimicrobial prescribing practices.[3] However, there have been varying conclusions drawn regarding sustainability and generalisability of outcomes.[4–6] This quality improvement project aimed to reduce unnecessary antimicrobial prescribing in ambulatory URI encounters.

METHODS

Setting

Mayo Clinic Health System—Southeast Minnesota (SEMN) River Corridor Family Medicine (FM) Department is composed of 19 physicians and 21 advanced practice providers (APPs) practicing across six clinical sites. A single ASP pharmacist allocated 1.0 FTE is responsible for inpatient and ambulatory ASP for the SEMN region.

Data

Data were pulled from the institutional electronic health record using Epic Slicer-Dicer (Epic, Verona, WI). Diagnostic codes were derived from the International Classification of Disease, 10th revision (ICD-10) and were categorised into diagnostic tiers based on whether antibiotics were always (tier 1), sometimes (tier 2) or not indicated (tier 3). Examples of tier 3 URI diagnoses included acute rhinosinusitis, bronchitis/bronchiolitis, influenza and serous/nonsuppurative otitis media.[3] The primary outcome was the antimicrobial prescribing rate, calculated by dividing the total tier 3 URI visit-based encounters where antibiotics were prescribed by the total tier 3 encounters (table 1). ICD-10 codes for COVID-19 were excluded given large encounter numbers to prevent gross denominator inflation. No other viral ICD-10 codes were excluded. Outcomes were analysed using Pearson's X^2 tests with p values of <0.05 considered statistically significant.

Intervention

PDSA 1: PDSA 1 ran from August to December 2022 and aimed to decrease the rate of antimicrobial prescribing in tier 3 URI diagnoses. The primary intervention was email dissemination of monthly peer comparison reports to all providers, regardless of the provider type. Peer comparison emails included individual and departmental prescribing rates for tier 3 URI diagnoses, tier 3 URI encounter definition, two-part negative-positive communication strategies, recommendations for appropriate ICD-10 coding and highlighted tools developed by the institutional ASP (antibiotic order panel, symptomatic management pad, provider-facing dashboard and diagnosis calculator).[3 7 8] During the 5-month course of PDSA 1, tier 3 antimicrobial prescription decreased from 16.81% to 14% (p=0.24), as compared with the previous year (table 1). Knowledge gained from PDSA 1 informed PDSA 2, which aimed to further improve antimicrobial prescription for tier 3 URI diagnoses among advanced practice providers (APPs) within the same department.

Table 1 Comparison of antimicrobial prescribing rates in tier 3 diagnoses by timeline and provider type

Timeframe	Intervention	APP	Physician	All provider types
8/1/21-12/31/21	N/A pre-intervention	15.18% (29/191)	19.73% (29/147)	16.81%(58/345)
1/1/22-5/31/22	N/A pre-intervention	24.14% (49/203)	23.15% (47/203)	23.53%(96/408)
8/1/22-12/31/22 PDSA 1	Monthly peer comparison emails to all provider types	15.16% (72/475)	11.43% (20/175)	14%(92/657)
1/1/23-5/31/23 PDSA 2	Monthly peer comparison emails to APPs and academic detailing for APPs meeting criteria	9.96% (28/281)	21.15% (33/156)	13.96%(61/437)

APP, advanced practice provider

PDSA 2: Dissemination of peer comparison emails was continued monthly for APPs only, with frequency reduced to quarterly for physicians. In addition to peer comparison reporting, APPs with greater than five prescriptions and a greater than 20% prescribing rate during PDSA 1 completed academic detailing sessions with their supervisor and ASP pharmacist. The ASP pharmacist served as a content expert and the direct supervisor emphasised accountability.

Thereafter, APPs with greater than three prescriptions and a greater than 10% prescribing rate per month were additionally scheduled for academic detailing. Academic detailing sessions occurred virtually, highlighting provider prescribing rates as compared with peers, communication strategies and enterprise-developed tools,and also included a dialogue around barriers to antibiotic non-prescribing.[3 8] During this same period, academic detailing was not offered or completed for physicians.

RESULTS

Academic detailing was performed in a total of four APPs accounting for 63% (45 of 72) of tier 3 antibiotic prescribing by APPs and 49% of the total FM department during PDSA 1. Five providers met the criteria for academic detailing, with three sessions performed in January 2023 and one in March 2023. Academic detailing was omitted for one provider (6 of 45 total tier 3 antibiotic prescriptions by APPs for PDSA 1) secondary to departure.

A statistically significant reduction in antimicrobial prescribing rate among APPs was observed following peer comparison report dissemination combined with criteria-based academic detailing sessions as compared with the previous year (24.14%% vs 9.96%; p<0.001), as well as compared with the PDSA1 where only peer comparison report dissemination was used (15.16% vs 9.96%; p=0.042) (table 1). Conversely, the absence of academic detailing coupled with reduced frequency of peer comparison dissemination from monthly to quarterly was associated with a statistically significant increase in antimicrobial prescribing for tier 3 URI among physicians (11.43% vs 21.15%; p=0.016) (table 1).

DISCUSSION

Implementation of academic detailing for prescribers meeting pre-set criteria, in conjunction with monthly peer comparison emails, was associated with a reduction in inappropriate antimicrobial prescribing for tier 3 URIs compared with the same period during the previous year. It was also associated with a greater reduction than with monthly peer comparison emails alone (PDSA 1). Additionally, when the frequency of peer comparison reporting was reduced for physicians from monthly in PDSA 1 to quarterly in PDSA 2, there was a statistically significant increase in inappropriate prescribing.

The data suggest that a multimodal approach produced a greater impact than a single intervention. Active interventions such as academic detailing require higher resource utilisation but may be correlated with improved results. In contrast, peer comparison reporting is a passive intervention and requires significantly less time. The statistically significant increase in inappropriate prescribing rates by physicians associated with a reduction in the frequency of peer comparison reporting suggests that while this intervention can make a meaningful impact, increased frequency is more likely to produce a greater and more sustained improvement in antimicrobial prescribing. Resource availability for ASPs is typically finite, underscoring the importance of maximising impact with available resources when considering interventions aiming to optimise prescribing outcomes.

While academic detailing combined with monthly peer comparison was associated with a reduction in inappropriate antimicrobial prescribing, these strategies may be more feasible in smaller community practice settings as opposed to large academic medical centres with larger prescriber numbers, thereby limiting external validity. Additionally, the smaller practice setting resulted in lower encounter numbers, thereby increasing the potential impact of variation in prescribing practices and individual patient characteristics.

CONCLUSION

Implementation of a multimodal programme was associated with a reduction in inappropriate antimicrobial

prescribing for URI compared with the same period during the previous year. Further research is needed to better understand the ideal frequency of educational interventions to best support ambulatory ASP efforts.

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ORCID iD

Brian T Burroughs http://orcid.org/0000-0003-4529-018X

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