Occurrence of potential prescribing cascades after hospital discharge: a cohort study

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Background

Medication-related harm, including adverse drug reactions (ADRs) appears to be common after transitions of care [1]. When medication changes are implemented during a hospital stay, ADRs may manifest after hospital discharge [2]. It is therefore essential that these potential ADRs are monitored and managed effectively after discharge. With insufficient information exchange to the patient and next healthcare providers, there is an increased risk that a healthcare provider fails to recognise an ADR and treats this as a new medical condition with a new prescription. This is known as a prescribing cascade (PC) [3, 4].

Aim

Therefore, the aim of this study was to assess the occurrence of potential PCs after hospital discharge. The secondary aim was to identify whether the additional medication was started by a healthcare provider from the hospital where the medication was initiated or by a healthcare provider from another setting.

Methods

A cohort study was conducted among adult patients admitted in one hospital between 2019 and 2023, who initiated an initial, so called index medication during their stay. A PC was defined as the initiation of a second, so called marker medication which may be intended to treat an ADR induced by the index medication. Data from the hospital and the Nationwide Medication Record System were used to identify potential PCs post-discharge.

The primary outcome was the cumulative incidence of PCs, estimated for PCs with ≥10 patients initiating the index medication. The secondary outcome was the number of PCs for which ≥50% of marker medication was prescribed by an healthcare provider outside the hospital, for PCs with ≥10 patients initiating the marker medication. Descriptive statistics were used.

Table 1: Occurence of potential prescribing cascades

Potential prescribing cascade Initial (index) medication – ADR – Second (marker) medication	Number starting index	Number starting marker (%)	Start marker by HCP outside hospital
ACE-inhibitors – Cough – Antibacterials for cough (systemic use)	1,286	51 (4.0)	32 (62.7%)
ACE-inhibitors – Cough – Antihistamines (systemic use)	1,267	37 (2.9)	31 (83.8%)
ACE-inhibitors – Cough – Antitussives	1,268	69 (5.4)	64 (92.8%)
ACE-inhibitors – Erectile dysfunction – Medications used in erectile dysfunction	1,411	22 (1.6)	17 (77.3%)
ACE-inhibitors – Urinary tract infections – Antibacterials for urinary tract infections (systemic use)	1,037	128 (12.3)	92 (71.9%)
Amiodarone – Hypothyroidism – Thyroid hormones	428	17 (4.0)	8 (47.1%)
Angiotensin II receptor blockers – Erectile dysfunction – Medications used in erectile dysfunction	1,209	10 (0.8)	5 (50.0%)
Antipsychotics – Hyperprolactinemia or Oligomenorrhea – Prolactin inhibitors	177	0 (0)	-
Antipsychotics – Parkinsonism – Tertiary amines/ Dopaminergics	169	1 (0.6)	-
Beta blocking agents – Erectile dysfunction – Medications used in erectile dysfunction	2,881	17 (0.6)	13 (76.5%)
Dihydropyridines – Edema peripheral – High-ceiling diuretics	1,288	81 (6.3)	36 (44.4%)
Dihydropyridines – Erectile dysfunction – Medications used in erectile dysfunction	1,395	12 (0.9)	9 (75.0%)
HMG CoA reductase inhibitors – Cognitive impairment – Anti-dementia medications	2,786	3 (0.1)	-
HMG CoA reductase inhibitors – Erectile dysfunction – Medications used in erectile dysfunction	2,742	27 (1.0)	21 (77.8%)
Low-ceiling diuretics – Erectile dysfunction – Medications used in erectile dysfunction	302	5 (1.7)	-
Non-dihydropyridines – Erectile dysfunction – Medications used in erectile dysfunction	671	0 (-)	-
Proton pump inhibitors – Clostridium difficile infection – Intestinal antiinfectives	3,945	22 (0.6)	7 (31.8%)

ADR: adverse drug reaction; HCP: Health care provider.

Results

Of 24,282 patients initiating index medication, 502 experienced potential PCs (Figure 1). The cumulative incidence was estimated for 17 PCs and is shown in Table 1. The cumulative incidence ranged from 0% to 12.3%. For nine PCs, over 50% of marker medications were prescribed by healthcare providers outside the hospital.

Conclusion

The cumulative incidences of potential prescribing cascades observed after hospital discharge indicate that there is room for improvement in managing ADRs to reduce prescribing cascades. In many cases, the medication which may have been added to treat a potential ADR was prescribed by healthcare providers from outside the hospital where the initial medication was started.

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