Background: Misuse and medication errors are common causes of patient morbidity. Patient adherence to prescribed treatment for chronic conditions has been estimated to be on average about 50% (1), drug related problems may cause as much as 30% of acute admissions to hospital care (2) and the costs have been estimated to be of the same magnitude as the direct costs for pharmaceutical drugs. Discrepancies between medical records and patients stated current medication are common (3-5).

E-prescribing, from physicians’ electronic medical record (EMR) directly to the pharmacies, constitute >75% of all prescriptions in Sweden and >70% of patients in Sweden store their prescriptions electronically in the national prescription repository (NPR), accessible from any pharmacy in Sweden. New e-prescriptions are automatically stored in the NPR. Prescriptions are stored in the NPR as long as a new dispensing is allowed. Patients can receive a printout at any pharmacy with information on the stored prescriptions or see them via a personnel code via internet.

Of legal reasons, physicians are only allowed to see the prescriptions stored in the NPR if the patient chooses to let the doctor see them. Physicians are neither able, nor allowed to institute any changes in the stored prescriptions. Pharmacists are able and allowed to make changes in or destroy the stored prescriptions, but on patient demand only. Consequently, the NPR may contain both prescriptions for current actual treatment and for non-current, previously changed or terminated treatment as well as prescription duplicates. For patients with many medications and/or many changes in the treatment the risk for mistakes and medication errors may be increased.

Objective: The objective was to compare the prescribed current treatment stated by patients with chronic diseases with (a) the data on prescribed treatment in the EMR and stored prescriptions in the NPR, and (b) the study the presence of prescriptions for non-current (changed or terminated) treatment, prescription duplicates and prescriptions for “double medication” in the EMR and the NPR.

Design: Cross-sectional study. Patients, over 18 years of age with diagnoses of either chronic heart failure (CHF), diabetes mellitus (IDDM or NIDDM) or arthritis and a prescribed treatment with >5 drugs in the EMR. Patients with more than one of the diagnoses were included in the order 1.CHF, 2.diabetes and 3.arthritis. A random sample of patients received an invitational letter to the study. Patients giving written informed consent to participate were interviewed on their prescribed current treatment and compared with printouts of the prescribed treatment from the EMR and stored prescriptions in the NPR. The prescriptions were classified as a) current active treatment or b) non-current, previously changed or terminated treatment. Prescription duplicates (identical prescribed treatment with regard to substance, administration formula, strength and dosage) and prescriptions for double medication (prescriptions for the same symptom but differing with respect to prescribed strength, dosage or substance), were identified.

Setting: Patients listed at one Health Care Central in Kalmar in south Sweden. The patients were interviewed by telephone during February 2010.

Main Outcome Measures: Proportions of prescriptions for (a) non-current treatments that had been changed or terminated, (b) prescription duplicates and (c) “double medication” in the NPR.

Results: Of 161 invited patients (50 diabetics, 61 with CHF and 50 with arthritis) 78 patients with 787 prescriptions gave written informed consent to participate. Sixty-seven patients (88%) had at least one non-current prescription, prescription duplicate or prescription for double medication in the NPR. Of the prescribed current treatment stated by the patients, 68.5% of the prescriptions were found in the NPR and 92.5% were found in the EMR. However, only 59% were present in both EMR and NPR, the lowest figures seen among those 65-74 years old - see Figure 1 and 2.

Of the 557 prescriptions in NPR, 11% were for non-current (changed or terminated treatment) and 6% were duplicates - see Figure 3.

In the EMR, 17% of the 710 prescriptions were for non-current (changed or terminated treatment), 5% were duplicates and 3 % double medication - see Figure 4.

Discussion: Prescriptions for non-current treatment and prescription duplicates are common. Almost nine out of ten patients had at least one non-current prescription or duplicate prescription in the EMR and the NPR. The results are consistent with the findings that discrepancies between EMRs and claims data on the one hand and patient reported current medication use on the other, are common (3-5). Both the printouts from the EMR of the prescribed drug treatment and of the prescriptions stored in the NPR generate prescription records with brand names used by the prescriber when issuing the prescriptions. However, due to mandatory generic substitution in Sweden, other brands/product names may have been dispensed.

Patients with many medications and/or frequent changes in the prescribed treatment may have difficulties to keep record of and adhere to the current prescribed treatment. Missing prescriptions as well as the occurrence of prescriptions for non-current therapy and prescription duplicates and conflicting information on current prescribed drug treatment is a source for medication mistakes and errors which may be aggravated by the mandatory generic substitution. However, according to our knowledge, there are yet no studies determining to what extent this contribute to adverse drug reactions and acute admissions due to drug related problems.

Conclusions: Prescriptions for non-current treatment that previously has been changed or terminated and prescription duplicates are common in both the EMR and the Swedish NPR. The risk for medication errors in the open care setting may be substantial.

References:
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