Abstract 2SPD-019 Table 1

ATC class (No of occurrence; rate)	N class (278; 21.3%)	V class (232; 17.8%)	Antimicrobial agents J class (246; 18.9%)	Oncology L class (159; 12.2%)	Haematology B class (101; 7.7%)
Recurrence per year (2014; 2015; 2016; 2017; 2018)	134 (14; 23; 27; 46; 24)	190 (2; 67; 85; 28; 8)	130 (13; 11; 24; 61; 21)	93 (19; 10; 11; 46; 7)	51 (2; 4; 10; 31; 4)
Rate of shortages; quotas; issues	86.3%; 9%; 4.7%	97.8%; 0%; 2.2%	65.1%; 27.6%; 7.3%	83.7%; 13.2%; 3.1%	59.4%; 16.8%; 23.8%
Median duration (weeks)	4.57	3.79	5.29	4.43	3.79
Rate of unavailability (%)	9.2%	38.1%	17.7%	15.6%	8.4%

quarter there were shortages of third generation cephalosporins.

Conclusion and relevance All classes were affected. Rippling effects in J class may be assumed regarding the evolution of drug shortages. That may lead to worse consequences, such as antibiotic resistance or disruptions to patient care.

REFERENCES AND/OR ACKNOWLEDGEMENTS

No conflict of interest.

2SPD-020 IMPACT OF MEDICINE SHORTAGES ON AN OUTPATIENT CLINIC OF A GENERAL HOSPITAL

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Background and importance The incidence of medicine shortages (MS) has increased in the past few years, causing difficulties for clinicians, patients and regulators. MS can occur for many reasons, including manufacturing and quality problems, regulatory issues and business decisions. The role of the pharmacist is essential in their management.

Aim and objectives To analyse the MS that have affected the outpatient clinic (OC) between January 2018 and September 2019, and to evaluate their economic impact and effect on the daily work of a hospital pharmacist in a general hospital (280 beds).

Material and methods A descriptive, observational and retrospective study was carried out analysing data between January 2018 and September 2019. Data were retrieved from official notifications received by email, the Spanish Medicines Agency (AEMPS) online platform and the Farmatools programme. Variables collected were: drugs with shortage problems, medicines available through the application for management of medicines in special situations (AGMSE) of the AEMPS, MS emails received, orders of foreign medicines and dispensations and time dedicated to managing MS.

Results During the study period, 1162 emails about MS were received and revised (average 55 per month). Forty-seven drugs with shortage problems were available through AGMSE as foreign medicines and 39 of them (83%), corresponding to 31 active substances, were managed from the OC: 92.3% of drugs imported, 2.5% performed as magistral preparations and

5.1% dispensed from inpatient stock. A total of 122 medicine orders were done, 6 per month, resulting in a total cost increase of 7643.73€.

According to Spanish law, foreign medicines must be provided by hospital pharmacies; therefore, 280 new outpatients who usually collect their medication at the community pharmacy attended the OC (a total of 739 dispensations, 35.19 per month).

The average time devoted to shortages in the OC was 10.13 hours per month, 5.15 hours for dispensation and pharmaceutical care activity and 4.85 hours for executing orders, and reception and administrative tasks.

Conclusion and relevance MS are time consuming and imply a significant increase in the hospital pharmacist's activity, mainly focused on administrative responsibilities, adding new drugs in formulary and planning for strategies to maintain the medication supply. Furthermore, this problem implies a higher number of patients attending the OC to collect their medication.

REFERENCES AND/OR ACKNOWLEDGEMENTS

No conflict of interest.

2SPD-021 SURVEY OF DRUG SHORTAGES IN HUNGARIAN HOSPITALS

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Background and importance Drug shortages pose an enormous challenge to healthcare systems globally. However, the data available are limited, as there are 53 surveys in the literature and only 54.7% (29) contain any information regarding the prevalence of drug supply issues.

Aim and objectives Our aim was to develop a questionnaire based on the available surveys and collect evidence of drug shortages in Hungarian hospitals.

Material and methods With an extensive literature search between 1 and 15 April 2019, we identified the relevant surveys and questionnaires, and then developed a Hungarian version with 45 questions categorised into 5 main sections: (1) institutional data and demographics; (2) prevalence and background; (3) management of drug shortages; (4) information sources; and (5) consequences of drug shortages. Data were collected between 15 May and 30 June 2019, with an online survey among hospital pharmacists.

Results A total of 42 hospital pharmacist completed the survey: 36 women and 6 men, mainly >36 years of age (73.8%), from various institutions and scope of activities. We found that 52.4% experienced drug shortages more than 10 times in the past 6 months. The top five ATC groups included B (blood and blood forming organs (52.4%)), C (cardiovascular system (50%)), L (antineoplastic and immunomodulating agents (47.6%)), J (anti-infectives for systemic use (38.1%)) and N (nervous system (38.1%)). Active pharmaceutical ingredients highlighted were immunoglobulins, digoxin, sodium ferric gluconate, phytomenadione, idarubicin and amoxicillin/clavulanic acid. Original and generic drugs, and parenteral and oral dosage forms were equally affected. According to 53.7% of participants, drug shortage situations usually lasted for months. The main reasons noted were

manufacturing problems (66.7%), tendering processes (54.8%) and raw material supply problems (52.4%). Serialisation was also mentioned (16%) as a cause of drug shortages.

Conclusion and relevance This is the first time a drug shortage survey focusing on Hungary has been completed. The data and tendencies collected were mainly in accordance with results of previous surveys and global tendencies. However, a new finding is that drugs belonging to ATC group B were affected the most by supply disruptions in Hungary. In addition, this is the first time that serialisation was linked with drug shortages in a survey.

REFERENCES AND/OR ACKNOWLEDGEMENTS

No conflict of interest.

2SPD-022 DRUG SHORTAGES AND DRUG UNAVAILABILITY: ANALYSIS FROM AN ITALIAN HOSPITAL

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Background and importance Medication shortages and unavailability have become a growing worldwide issue because of their possible clinical impact: reasons can be related to parallel trading (drug unavailability) or lack of production (drug shortages). When they occur, identifying a similar drug may be required or the drug is imported from abroad.

Aim and objectives The aim of the study was to perform an analysis of drug shortages (DS) and drug unavailability (DU) occurring at the centre from January 2018 to June 2019.

Material and methods The analysis included every DS and DU for every drug included in the formulary from January 2018 to June 2019. Any drug request received by the pharmacy during this time was analysed to determine DU and DS, and the drugs involved. Classification of DU or DS was performed through consultation on the DS list published by the Italian Medicines Agency. The analysis was performed for three time points: first semester 2018 (S1), second semester 2018 (S2) and first semester 2019 (S3). Also, an analysis of the medication group involved over time was performed.

Results The analysis detected DU for 19 drugs included in the formulary: S1 (2: intravenous ampicillin 1 g, ceftazidime 1 g), S2 (5: intravenous midazolam 5 mg, oxacillin 1 g, iron gluconate 62.5 mg, methylprednisolone 40 mg, glutathione 600 mg), S3 (12: intravenous piperacillin/tazobactam 2.25 g and 4.5 g, lysine acetylsalicylate 500 mg, hydrocortisone 100 mg, suxamethonium 5 mg, ceftazidime 1 g and 2 g, cefepime 2 g, glutathione 600 mg, methylprednisolone 40 mg, heparin 5000 units, atracurium 50 mg). Ten cases of DS requiring importation were found: S1 (4: mupirocin 2% nasal ointment, intravenous chlorphenamine 100 mg, alprostadil 20 µg, etilefrine 10 mg), S2 (3: intravenous diazepam 10 mg, lorazepam 4 mg, fructose 5 g), S3 (4: oral labetalol 5 mg, danazol 200 mg, sodium nitroprusside 50 mg, intravenous fructose 5 g). Medications groups involved in DU and DS were: antibiotics (31%), non-steroidal anti-inflammatory drugs (20.7%), benzodiazepine (10.4%), antihypertensive (10.4%), dietetics (10.4%), anaesthetics (6.9%), urological drugs (3.4%), antihistamines (3.4%) and adrenergic drugs (3.4%). The rate of DS did not change over time, while DU increased from S1 to S2 (+150%) and from S2 to S3 (+150%).

Conclusion and relevance While the number of DS requiring drug importation remained constant, DU strongly increased over time, leading clinicians to identify similar treatments. The analysis did not show any prevailing medication group over time.

REFERENCES AND/OR ACKNOWLEDGEMENTS

No conflict of interest.

2SPD-023 HOW MUCH DOES FALSIFIED MEDICINES DIRECTIVE ACTUALLY COSTS? DETAILED COST EVALUATION OF SERIALISATION IN A REPRESENTATIVE SAMPLE OF HUNGARIAN HOSPITAL PHARMACIES

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Background and importance The aim of the falsified medicines directive (FMD 2011/62/EU) is to prevent the entry of illegitimate medicines into the legal supply chain. Despite its proposed benefits, the indepth evaluation of cost implications for hospital pharmacies is still lacking.

Aim and objectives Our study evaluated the current practice of serialisation and the financial impact of the FMD in a representative sample of Hungarian hospitals.

Material and methods Based on literature review and interviews with hospital pharmacy experts, a 41 item questionnaire was developed to evaluate the implementation process leading up to February 2019, and the stabilisation period that followed. Questions regarding institutional data, human resource requirements, infrastructural and IT developments, and authentication procedures were sent out to all (n=96) Hungarian hospital pharmacies in September 2019.

Results A high response rate (n=43, 44.8%) allowed representative data evaluation of Hungarian hospitals. By the initial launch date of FMD, the average increase in pharmacist workload was 0.92 (±0.98) hours/day, and it was estimated to increase further by 1.13 (±1.65), equalling 0.25 pharmacist full time equivalents (FTE)/institution. Additionally, FMD seemed to increase technician workload significantly compared with pharmacists (p<0.001), as by February, 2.25 (±1.42) hours, and in the long term a further 4.01 (±3.88) daily working hour increase was reported (equalling approximately 0.75 technician FTE/institution). Average non-human resource (eg, infrastructural, IT, etc) costs related to the implementation of the directive in February 2019 were 1868€/institution with a high variation (±3331€) due to inter-institutional differences but significantly lower costs are expected in the long term in the stabilisation phase (421±785€). FMD has affected the hospital supply chain in numerous ways, as 76.7% of respondents faced drug shortages, 58.1% reported suspected increases in drug costs of serialised medications and 53.5% noticed an increase in packaging size affecting storage capacities.

Conclusion and relevance Our results illustrated that the FMD had notable short and long term impact on hospital pharmacies. Our aim is to adapt this methodology to other EU countries and identify good practices in serialisation at an international level.