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Targeting the Burden of Polypharmacy in the elderly

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Prevalence of Multimorbidity in Elderly Attending Public Health Care Services in Mexico

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BACKGROUND/AIMS

Multimorbidity (simultaneous coexistence of more than one chronic condition in a single individual) is common, particularly in older adults with a prevalence of 65–98%. The Mexican Institute of Social Security (Instituto Mexicano del Seguro Social; IMSS, Spanish Acronym) supplies primary health care to 34.5% older adults. The objective of this study was to estimate the prevalence and patterns of multimorbidity in a sample of older adults (≥ 60 years) that attended four Units of Family Medicine (UFM) of the IMSS.

MATERIALS AND METHODS

A secondary analysis of the database of electronic health records (EHR) of four UMF from Mexico City covered an estimated population of 585,535 people of which 60% are ≥ 60 years. The clinics were selected for convenience. These clinics used identical EHR. We included the diagnoses of chronic diseases in patients who attended at least once to receive medical care during the year 2009 and used the definition of chronic disease proposed by WHO as selection criterion. We estimated the prevalence of multimorbidity based on the co-occurrence of 2, 3 and 4 diseases.

RESULTS

The sample included 47,345 EHR of people aged ≥ 60 years. 61.4% were woman; the mean age was 71.3 ± 8.1 years. The proportion of older people without multimorbidity was 26.5%. The major proportion of older people had 2 chronic diseases (29.2%) and 12.9% had 4. The most frequent diseases were: hypertension (64.1%), musculoskeletal and connective tissue disease (MCTD) (43.7%), diabetes mellitus (30.4%), dyslipidemia (23.5%) and vascular disease (15.6%). The most frequent combination of 2 diseases was hypertension + MCTD; the combination of 3 diseases was hypertension + MCTD + diabetes mellitus; the combination of 4 diseases was hypertension + MCTD + diabetes mellitus + dyslipidemia.

CONCLUSION

The knowledge of the common combinations of multimorbidity may help in planning the necessary health services.

Antipsychotic Drug Interactions and Mortality Among Nursing Home Residents With Cognitive Impairment

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BACKGROUND/AIMS

Antipsychotic medications are prescribed off-label for the treatment of behavioural and psychological symptoms of dementia (BPSD). Among elderly individuals with dementia, the use of antipsychotics has been associated with serious adverse events including ischemic stroke and death. Multiple medications can interact with antipsychotics and increase the risk of such adverse events.

The purpose of this study was to estimate the prevalence of potential antipsychotic-drug interactions and their effect on increasing the risk of death among cognitively impaired elderly individuals treated with antipsychotics.

MATERIAL AND METHODS

This was a retrospective longitudinal cohort study. The sample consists of 604 individuals aged 65 years or older, being treated with antipsychotics and residing in 59 nursing homes (NH) of seven European countries and Israel, participating in the SHELTER – Services and Health for Elderly in Long TERM care – study.

Participants were assessed using the interRAI instrument for Long Term Care Facilities (interRAI LTCF). Prevalence of potential antipsychotic-drug interactions was estimated. Risk of death was the primary outcome. Follow up time was 12 months.

RESULTS

The prevalence of potential antipsychotic-drug interactions was 46.0%. Antipsychotic drug-interactions were associated with higher mortality (incidence rate (IR) 0.26 per person-year (p-y) in the antipsychotic drug interaction group versus 0.17 per p-y in



the no antipsychotic drug interaction group). After adjusting for potential confounders, risk of death was higher in the group of residents with potential antipsychotic drug interactions relative to those unexposed to such interactions (Hazard Ratio (HR) 1.68, 95% Confidence Interval (CI): 1.13 – 2.49).

CONCLUSIONS

Part of the observed excess risk of death associated with the use of antipsychotic medications in elderly individuals with cognitive impairment may be attributable to antipsychotic-drug interactions. The use of antipsychotics should be extremely cautious especially among those individuals receiving concomitant cardiovascular and psychotropic medications.

Inappropriate Use of Antiplatelet Therapy in Very Old Patients on Anticoagulation for Atrial Fibrillation

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INTRODUCTION

Very old patients on anticoagulation for atrial fibrillation are sometimes on antiplatelet therapy (AP) which significantly increases the risk of major bleeding. Using recent guidelines^[1], we studied AP inappropriateness in these patients.

METHODS

Cross-sectional study in 317 inpatients (84±5 years) in a Belgian teaching hospital (2008-2010) with older age (≥75 years), atrial fibrillation, elevated risk of cardio-embolism (CHADS2 ≥2), long-term anticoagulation and comprehensive geriatric assessment. The annual risk of major bleeding was predicted using the HEMORR2HAGES score. The main endpoint was the inappropriate chronic use of AP in the absence of recent coronary artery disease (i.e. > 12 months after myocardial ischemia or coronary stenting).

RESULTS

AP use was appropriate in 12 and inappropriate in 77 patients. The 77 patients with inappropriate AP differed from the 228 patients without AP therapy in male gender (57 vs. 43%, p=0.04), diabetes mellitus (32 vs. 18%, p=0.01) and ischemic vascular disease (62 vs. 45%, p=0.01). They did not differ in geriatric syndromes and functional/cognitive status. Their predicted annual risk of major bleeding was higher than the risk of the 228 patients without AP (9.3±2% vs. 7.4±2%, p<0.001)^[2]. Withdrawing AP in these 77 patients would reduce their annual bleeding risk to 7.5±3%.

CONCLUSIONS

AP withholding or withdrawing in the absence of a recent ischemic event or coronary stenting might prevent each year 2% of major bleeding in this older population on anticoagulation. Geriatricians, cardiologists and diabetologists should aim at a consensus on the appropriate anti-thrombotic regimen in older patients in atrial fibrillation.

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Polypharmacy in Very Elderly Chronic Myeloid Leukemia Patients Treated With Tyrosine Kinase Inhibitors

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With the introduction of tyrosine-kinase inhibitors the expected survival of CML patients is approaching that of the general healthy population, so that a large number of patients are elderly or very elderly. Imatinib is effective even in this setting despite of concomitant therapies that may require pharmacologic adjustments to avoid drug interactions. We wanted to assess if and which concomitant drugs have an impact on both outcome and toxicity in CML very elderly patients (age >75 years). Two hundred and two very elderly CML patients treated with imatinib frontline were retrospectively evaluated using data collected from 31 Italian Institutions. Median age at imatinib start was 78.7 years (range 75-93); 109 (54.0%) were male. According to Sokal Score, 60 patients (29.7%) were high risk. Sixty-four (31.7%) were treated with imatinib <400 mg/day, and the remaining patients with imatinib >400 mg/day. Complete cytogenetic response (CCyR) was obtained in 33 (16.3%) cases within 12 months and in 85 (42.1%) after 12 months. Concomitant drugs were 1-2 in 76 (37.6%) patients, 3-4 in 56 (27.7%), and >5 in 41 (20.3%); 29 (14.4%) did not assume any concomitant medications. Antihypertensive drugs and PPIs were the most frequent therapies associated with imatinib. Thus, we focused on the effects of these two classes of drugs. In this preliminary analyses, patients assuming beta-blockers obtained CCyR later than 12 months ($p=0.017$), while those assuming angiotensin II receptor blockers showed a trend toward a significant association ($p=0.056$). On the contrary, we did not find any significant correlation between antihypertensive drugs or PPIs and grade 3-4 hematologic and extra-hematologic toxicities. Our preliminary results confirm the safety and efficacy of imatinib also in very elderly patients. Further analyses will be done to investigate other classes of drugs as predictors of outcome or toxicities to help selection of the most appropriate combination therapies.

Advanced Age and Medication Prescription

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BACKGROUND/AIMS

Older adults often show the co-occurrence of multiple diseases, whose prevalence progressively and steadily increases with aging. The treatment of these diseases requires multiple medications (polypharmacy), and it has been estimated that more than 10% of population aged 65 years or older receives ten or more medications concomitantly. The aim of this study is to describe in a large, national representative, sample how prescription of medications varies across age groups, with specific focus on the oldest old.

MATERIALS AND METHODS

This is a cross-sectional study using 2013 data from the OsMed Health-Database, which comprises all prescribed medications reimbursed by the Italian National Healthcare System in community setting. The study population amounts to 15,931,642 individuals (26.8% of the overall Italian population). Individuals aged ≥ 65 years or older are 3,378,725 (21.2% of the study sample). The main outcomes assessed were mean number of medicines and Defined Daily Doses (DDD) prescribed in 2013 and the use of individual medications.

RESULTS

The mean number of prescribed medications progressively raised from 1.9 in the age group < 65 years to 7.4 in the group 80-84 years and then declines, with a more marked reduction in the group aged 95 or older, which receives a mean number of 2.8 medications. A similar pattern was observed for the mean number of DDD. Among participants aged 65 or older, proton pump inhibitors were the most commonly prescribed medication (40.9% of individuals 65 or older), followed by platelet aggregation inhibitors (32.8%) and statins (26.1%). For most of the medications examined a decline in prescription was observed among individuals aged ≥ 90 years.

CONCLUSIONS

The burden of medication treatment progressively increases till age 85 years and substantially declines after age of 90 years with an inverse U shaped relationship. Patterns of medication prescription widely vary across age groups.



Pharmaceutical Care in Geriatrics in Poland – Assumptions of the Project

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BACKGROUND/AIMS

In Poland, in spite of the alarming data regarding the potential inappropriateness of pharmacological treatment among the elderly, there is no system of pharmaceutical care.

The aim of the research is to analyze the effectiveness of pharmaceutical care in geriatrics. The project will assess the appropriateness of pharmacological treatment of elderly patients who use multidrug regimen and pharmaceutical intervention will be undertaken in patients who are found to have inappropriate treatment.

MATERIALS AND METHODS

The study will be done among 300 elderly patients within 10 public pharmacies. The including criteria will be patient age (65 years +) and the number of drug taken regularly (10+).

Pharmacists qualified to the projects will organize meetings with the patients to assess the appropriateness of pharmacological treatment and in case of incorrect treatment they will do the interventions. If problems arise in relation to over-the-counter drugs, the pharmacist organizes an educational meeting with the patient and instructs him suggesting how to change pharmacotherapy. When the potential errors concentrate on a prescription drugs, the pharmacist informs the patient and recommends him to contact the family doctor.

RESULTS

The project will assess the number of potential medication errors in patients before the application of pharmaceutical intervention and after such intervention. The relationship between age, sex, education, economic status, self-esteem of health status, number of physicians treating and the severity of the polypharmacy and potential inappropriateness of treatment will be described.

CONCLUSIONS

The end result of the project is to create a practical model for geriatrics pharmaceutical care in Poland which will be based on the unique set of criteria defining potentially inappropriate pharmacotherapy in geriatrics created within the project.

Potentially Inappropriate Medications: Clinical Importance and One-Year Discontinuation Rate

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BACKGROUND

STOPP criteria were developed to help clinicians consider discontinuation of potentially inappropriate medications (PIMs) in older patients. Little is known on PIMs clinical importance and discontinuation rate.

METHODS

Cohort of 50 frail older patients, nested in a randomized controlled trial (intervention in 2011-2012, *Drugs Aging* 2014;31(4):291-8), with ≥ 1 STOPP criteria (2008 version) on hospital admission, and with one year follow-up. After analysis of the detailed medical record made by the geriatric consultation team, 3 experts (pharmacy, geriatric medicine, general practice) rated the clinical importance of the STOPP criteria as minor, moderate, major (prevention of hospital admission or major morbidity) or deleterious (increased risk of serious adverse event). Consensus was present when ≥ 2 of the 3 experts agreed. Discontinuation at one year was determined by postal survey to the general practitioner.

RESULTS

The 84 PIMs presented by the frail older patients were considered major (29%), moderate (37%), minor (5%), deleterious (8%) or could not be assessed (21%, some missing data). The most common PIMs of major importance were high risk of fall associated with benzodiazepines or antipsychotics (n=13), and high risk of bleeding (HEMORR²HAGES score) associated with antithrombotic agents (n=3). The criteria considered as deleterious were recommendation to withdraw β -blockers in diabetes with hypoglycaemia (n=4; compelling indication of β -blockers, e.g. myocardial infarction) or ACE inhibitor in heart failure and orthostatic hypotension (n=2). At one year, 34 of the 84 PIMs (40%) had been discontinued. The discontinuation rate was not related to the clinical importance (major 25%, moderate 32%, minor 75%, deleterious 28%).

CONCLUSION

A priority step towards the reduction of chronic inappropriate medications in older patients might be to focus on the STOPP criteria of major clinical importance. However, the few STOPP criteria considered as deleterious should be better defined in the next version of the STOPP list.



Introduction of a Novel Polypharmacy Care Pathway: Preliminary Results

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BACKGROUND

A care pathway has been installed at the geriatric department of the University Hospitals of Leuven, in which a 0.8 full-time equivalent clinical pharmacist mandate was allocated to the wards. Two pharmacists provide medication reconciliation and medication review services during the patient's hospital stay. Patient enrollment is but limited by the allocated pharmacist time.

AIMS

In this retrospective study, the impact of the care pathway is evaluated.

MATERIALS AND METHODS

A retrospective chart-based study was performed. Primary outcome is documenting the number of recommendations made by the CP. Secondary endpoints are the types of drugs involved as well as the types of recommendations. The capture rate, defined as the number of included patients vs. the total number of admitted patients, will be documented.

RESULTS

Forty-seven out of 253 inpatients were included with a mean age of 84.6 years. Overall, 343 recommendations were provided, of which 66.5% on admission, 17.5% during hospitalization and 16% at discharge. Drug classes most involved were cardiovascular drugs (16.9%), antithrombotic agents (12.8%) and gastrointestinal drugs (11.4%). Medication cessation was the major recommendation (32%), with vitamins and dietary supplements (18.3%), gastrointestinal drugs (17.4%), and psychotropic drugs (16.5%) being the main drug categories targeted. Currently, our capture rate has increased up to 30% of all admitted patients.

CONCLUSION

Preliminary results indicate that pharmacists provide an added value in a multidisciplinary geriatric team with a focus on drug cessation. However, there is still room for improvement regarding the capture rate. Time constraints are the major challenge. In the future, patient outcomes such as hospital readmissions should be taken into account to establish the clinical benefit of this project.

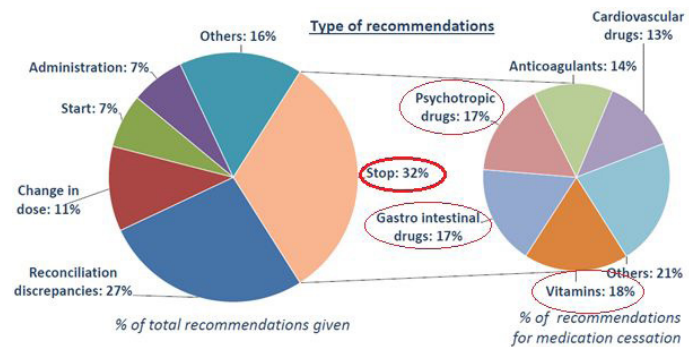


Figure 1: Type of recommendations



Orthostatic Hypotension and Medications in Geriatric Inpatients

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BACKGROUND

Orthostatic hypotension (OH) is frequent and often multifactorial in geriatric patients. We analyzed associations between OH and 1) patient's medical and geriatric characteristics, 2) in-hospital medications with potential blood pressure lowering effect.

METHODS

Cross-sectional study upon admission in the geriatric ward of an academic Belgian hospital. Testing was performed in 100 older patients (≥ 75 yrs) able to stand up (3 minutes) to detect OH (decrease of $\geq 20/10$ mmHg in systolic/diastolic blood pressure). Special attention was paid to medications affecting the vascular (V) system [diuretics, ACE inhibitors/angiotensin inhibitors, calcium channel blockers, β -blockers, central α -agonists, peripheral α -blockers, nitrates] or the central nervous (N) system [benzodiazepines, neuroleptics, antidepressants, opiates]. Each hospital medication was expressed in defined daily dose (DDD). The main outcome measure was the association between OH and DDD or geriatric characteristics.

RESULTS

1) Patients with OH ($n=47$) differed from those without OH ($n=53$) in recent fall history (79 vs. 56%, $p=0.01$), diabetes mellitus (32 vs. 13%, $p=0.03$), stroke history (34 vs. 25%, $p=0.03$), gender (51 vs. 33% male, $p=0.04$), but not in age (85.6 vs. 85.4 years old). 2) No statistically significant association was observed between the dosage of V or N medications (expressed in DDD) and the presence of OH. Multivariate analysis yielded similar results. OH was associated not with V or N medication dosages, but with geriatric characteristics such as fall (OR:4.4, $p=0.04$), male sex (OR:4.2, $p=0.02$), diabetes mellitus (OR:7.8, $p=0.03$) and vitamin B12 deficiency (OR:11.4, $p=0.02$).

CONCLUSIONS

OH does not seem to be associated with V nor with N medication dosages. If an association existed, it would probably be of low clinical significance. We further analysed these patients to look for a potential correlation between the orthostatic diminution of blood pressure and the dosage of these medications affecting the vascular and central nervous systems.

Defined Daily Dose and Orthostatic Decline of Blood Pressure Among Geriatric Inpatients

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INTRODUCTION

The relationship between cardiovascular or psychotropic drugs and orthostatic blood pressure (BP) decline is not well described in very old patients.

METHODS

This cross-sectional study analyzed 100 patients upon admission to the geriatric ward of a Belgian academic hospital. The maximum decline in systolic (SBP) and diastolic (DBP) blood pressure (mm.Hg) between the lying and the standing position (1 or 3 minutes) was measured. The defined daily dose (DDD) on the day of the orthostatic testing was used to calculate the dosage of medications potentially responsible for BP decline, related to the vascular (V) [diuretics, ACE inhibitors/angiotensin inhibitors, calcium channel blockers, β -blockers, central α -agonists, peripheral α -blockers, nitrates] and central nervous (N) [benzodiazepines, antipsychotics, antidepressants, opiates] system.

RESULTS

The lying SBP and DBP were respectively 136 ± 21 and 72 ± 14 mm.Hg in the 100 patients (85 ± 5 years, 58% women; 7.7 ± 4 medications, DDD: V 1.0, N 0.74). In standing position, SBP declined (mean \pm SD: 12 ± 17 mm.Hg), decreasing in 77 patients. In the SBP multivariate model (adjusted r^2 : 93%), the BP decline was significantly ($p<0.05$) and positively correlated with age, diabetes, history of falls, and number of medications, but not with the DDD of any of the nine medication classes. DBP also declined in orthostatism (11 ± 5 mm.Hg), decreasing in 74 patients. In the DBP multivariate model (adjusted r^2 : 87%), the decline was significantly ($p<0.05$) and positively correlated with age, diabetes, stroke and anemia, but again not with the DDD of any medication class.

CONCLUSION

The lack of correlation between the medication dosage and the orthostatic decline in blood pressure is an argument against their causal association in geriatric inpatients.



Proton Pump Inhibitors and Risk of Hypomagnesaemia

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BACKGROUND

PPI-associated hypomagnesaemia is a rare, but potentially life-threatening side-effect that has recently emerged as a consequence of their massive use, but the prevalence has not been established. The aims of this study were: (i) to evaluate the prevalence of hypomagnesaemia in a cohort of patients admitted in an internal medicine ward; (ii) to estimate the risk of hypomagnesaemia associated to PPI treatment according to the duration of treatment and the concomitant use of diuretics.

METHODS

All patients admitted in the internal medicine ward of the Ospedale di Circolo in Varese between February and November 2014 were enrolled in the study and serum magnesium (mg/dL) was measured. Hypomagnesaemia has been defined as plasma concentration of magnesium lower than 1.7 mg/dL (severe if <1.4 mg/dL).

RESULTS

Among the 604 patients recruited hypomagnesaemia has been detected in 85 (14.1%) patients and PPI were present in 63 cases (74.1%). The prevalence of hypomagnesaemia was significantly higher among patients taking PPI than in those not treated (21.1% vs 7.2%, <0.001). PPI resulted independently associated to an increased risk of hypomagnesaemia compared to patients not receiving PPI, also after adjusting the analysis for known risk factors. Use of loop or thiazide diuretics has not been significantly associated to hypomagnesaemia (OR 95%CI=1.61 (0.87-2.99), p=0.14; OR 95%CI=0.97 (0.61-1.56), p=0.91, respectively). Risk of hypomagnesaemia was higher among patients receiving PPI for less than one year.

CONCLUSION

Risk of hypomagnesaemia is higher among patients taking PPI from a period of less than one year. We suggest to carefully consider the appropriateness of PPI therapy before starting the treatment, recognize symptoms of hypomagnesaemia and reconsider PPI therapy in patients with low level of serum magnesium.

Tailoring of Glucose Lowering Therapy in Older Patients with Diabetes Mellitus

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INTRODUCTION

Little is known on insulin sensitivity and secretion in older patients with type 2 diabetes mellitus (DM2), a heterogeneous group of patients. Differences might indicate the need for tailored glucose lowering therapy.

METHODS

Cross-sectional study of 210 consecutive older (≥ 75 years) patients followed for DM2 at the outpatient diabetes clinic of an academic hospital. DM2 was classified as habitual-onset diabetes (HODM2) when diagnosed < 65 years or elderly-onset diabetes (EODM2) when diagnosed ≥ 65 years. Insulin sensitivity and β -cell function were assessed by HOMA modeling. Statistical significance ($p < 0.05$) of differences was assessed using Student's t-test, Welch's test or Fisher's Exact test.

RESULTS

Patients with EODM2 ($n=88$; 82.6 ± 5 years), as compared to HODM2 ($n=122$; 81.2 ± 6 years), had a shorter history of DM2 (10 ± 5 vs. 26 ± 10 years). Both groups were not different in terms of cardiovascular risk factors and DM2-related complications, except at the microvascular level (EODM2 vs. HODM2: 45 vs. 72%). EODM2 significantly differed from HODM2 in 4 anthropometric and metabolic characteristics: lower BMI (26.6 vs. 28.2 kg/m²), lower prevalence of obesity (18 vs. 27%), higher insulin sensitivity (66 vs. 53%) and higher residual β -cell secretion (68 vs. 52%). Although HbA1c was similar in both groups (7.31 vs. 7.62%), HbA1c < 7% was more frequently observed in EODM2 patients than in HODM2 ones (49 vs. 37%). EODM2 patients, as compared to HODM2 ones, received significantly lighter anti-diabetic regimens, specifically oral ones (bi- or tri-therapies: 28% vs. 59%) and insulin (32 vs. 66%, $p < 0.001$) at a lower mean daily dosage (0.47 vs. 0.57 IU/kg).

CONCLUSION

EODM2 patients present specific metabolic features and differ from HODM2 patients. Because of their higher risk of hypoglycemia, EODM2 patients should be treated with lighter glucose-lowering therapy.



Agreement Between Potential Drug Interactions Identified by an Electronic Tool and Clinical Judgment: INTERcheck® versus Physicians

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BACKGROUND

The software INTERCheck® provides physicians with the potential drug-drug interactions (pDDIs) of a patient therapy, classifying them based on clinical relevance from the literature, as A (minor), B (moderate), C (major), D (contraindicated).

AIM

To assess the concordance between the pDDIs clinical relevance as classified by the electronic tool INTERCheck® and physician's personal judgement.

MATERIALS AND METHODS

This retrospective study, conducted in 4 wards between April-October 2014, identified pDDIs from medical records of elderly inpatients ≥ 65 years, taking ≥ 5 drugs, by using INTERCheck®. Clinical relevance as classified by INTERCheck® was then compared with physician judgement through a structured interview consisting of four questions: is the actual pDDI known? is it clinically relevant?, if yes, why?, would knowledge of the pDDI at prescription time have changed your prescribing approach? Concordance between INTERCheck® and physician judgement

was defined as: classification of "clinically relevant=yes" by physician and class C-D by INTERCheck®; classification of "clinically relevant=no" by physician and class A-B by INTERCheck®.

RESULTS

Medical records of 60 inpatients were analyzed: 1658 drugs were prescribed, 448 unduplicated pDDIs were detected by INTERCheck® and subsequently evaluated by physicians. Of those, 227(51%) were unknown to the physician and 230(51%) were classified by them as clinically relevant: 154(67%) for the potential clinical impact, 54(24%) for patient complexity/co-morbidity, 17(8%) for other reasons. According to INTERCheck®, pDDIs were classified as: 12(3%) A; 275(61%) B; 108(24%) C and 53(12%) D. Concordance between physician judgment and INTERCheck® was: 17%(2/12) for A, 39%(108/275) for B, 75%(81/108) for C, 74%(39/53) for D. According to the physicians knowledge of the pDDI at the time of prescription would result in therapy change in 23%(52/227) of cases.

CONCLUSIONS

An increasing concordance between INTERCheck® and physician's judgement was found throughout the INTERCheck® classes. This finding will be taken into account to improve INTERCheck® action upon situations where a lower concordance was found.

The Recognition/Reconciliation Process in Elderly Patients: a Retrospective Study in Geriatric and Internal Medicine Wards

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BACKGROUND

Polypharmacy, commonly used in the elderly, is an important risk factor for drug related problems. In this context, the hospital pharmacist can contribute to support clinicians in promoting the safe use of medicines.

AIMS

To identify the need of an appropriate medication reconciliation in a sample of hospitalized elderly patients.

MATERIAL AND METHODS

Medical records of patients ≥ 65 years in polypharmacy (≥ 5 drugs) admitted during one month period to 5 general medicine and geriatric wards were retrospectively reviewed. The following data were collected by a hospital pharmacist: number of prescribed drugs, dose omission, frequency, administration route, pharmaceutical form, and potential drug-drug interactions.

RESULTS

We analyzed the medical records of 75 patients (36 men, 39 women, mean age 81 years). Overall, patients were admitted with 634 drugs used at home; in the first 24 hours after admission and at discharge, 723 and 645 drugs were prescribed, respectively. At the recognition stage, the dosage form was omitted in 17% of prescriptions, the dose in 12%, route of administration in 20%, frequency in 26%.

At discharge, the rates of omission decreased to 2% for dosage form, 2% for route of administration, 7% for frequency.

Overall, 1061 potential drug-drug interactions were identified.

In 13 medical records, medications were not prescribed in accordance with the hospital formulary; allergies/intolerances have not been taken into account in 2 discharge letters and in 2 inpatient prescriptions, while 9 suspected adverse drug reactions were not notified.

CONCLUSIONS

The review of the actual process of accuracy of drug registration in the patient's medical record highlights the need of a more structured procedure. An active role for hospital pharmacists is foreseen, in order to ensure a safe use of medicines.



Therapy with Proton Pump Inhibitors in Patients Aged Over 80 Years with Multiple Comorbidity

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BACKGROUND

We have analyzed the clinical history of eleven patients aged over 80 years who assumed daily therapy with Proton Pump Inhibitors (PPI), hospitalized in "Murri" Internal Ward - Policlinico of Bari, Italy, from May to December 2014.

MATERIALS AND METHODS

We have verified the therapeutic indications to PPI's for each patient and the comorbidity favoring long term adverse effects. The advanced age already constitutes a condition in addition to specific drugs or gastric hemorrhagic history.

RESULTS

About the therapeutic indications, nine out of 11 patients took at the same time ASA or oral anticoagulants; three of the latter had previous gastric hemorrhage and four took corticosteroid drugs.

In two cases the prescription was inappropriate despite the advanced age. In these patients, in fact, other drugs did not damage the stomach mucosa.

Regarding the risk of long term adverse effects, four patients suffered of osteoporosis and pathological fractures, that would seem to be influenced by PPI.

Moreover, during hospitalization this kind of therapy increases the probability of bowel infections like *Clostridium Difficile's* disease. Five patients were treated with broad-spectrum antibiotics and seven were bedridden and fed on liquid diet or presented chronic bowel diverticulitis. These factors normally constitute a damage for intestinal bacteria.

CONCLUSIONS

In patients aged over 80 years the use of drugs that damage the stomach mucosa as well as the frequent recurrence of gastric hemorrhages constitute accurate indications for a therapy with PPI in the majority of cases.

These drugs are safe at common doses, and during short periods of hospitalization their use is more protective than dangerous because of the higher risk of peptic ulcer.

Conversely, in the long term, the PPI's prescription should not be appropriate in aged people, because of the highest incidence of adverse effects such as bowel infections and severe osteoporosis. Considering the large diffusion of PPI, the appropriateness in prescription should improve healthcare management avoiding these complications.



Figure 1



Pilot Study of Changes in Eating Habits and Physical Exercise in People With Non Communicable Chronic Disease

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AIM

Non communicable chronic diseases are the most common cause of death in the world. Studies have shown that healthy eating habits associated to physical exercise can play a role in some non communicable disease prevention and in reducing mortality. The pilot study aims to improve eating habits and the potential positive effects in reducing risks factors of moderate physical activity.

MATERIALS AND METHODS

13 patients, aged 63 ± 15 with different non communicable chronic diseases (cancer, hypertension and diabetes), were enrolled in an individualized exercise and diet program for at least 6 months. Among the anthropometrics parameters, weight, BMI (body mass index), body folds (biceps, triceps, subscapular and supra-iliac) were considered. Food diaries were completed in two different check-ups, at the beginning of the study (T0) and after six months (T6). The eating habits evaluated were energy intake and macronutrient distribution, daily number of meals, and daily consumption of fruits and vegetables. According to ACSM guidelines, moderate physical activity was prescribed: 3 times a week for at least 30 minutes each session. From T0 and T6 evaluations a special nutritional advice, individualized per each patients, and following FDA bases (Food and Drug Administration) guidelines were available. Statistical analysis was performed using the paired Student T test.

RESULTS

From the analysis of food diaries, it emerges that after 6 months there was a significant reduction of frequency of meals a day ($p < 0.05$) and a very significant reduction of food intake ($p < 0.01$). In addition, the anthropometrics parameters showed that the triceps fold were significantly reduced ($p < 0.05$).

CONCLUSION

Simple proper nutritional guidance and physical exercise, in a short time, induced significant positive modifications in eating habits and decreases anthropometrics parameters associated to disease risk. The results of this study shows the intervention could be applicable to larger populations.

The Banality of Evil: Error Frequency in Therapy Assumption Without Medical Reconciliation: a Case Report

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We report a case of a 71-year old woman who was hospitalized several times also due to an incorrectly managed pharmacological therapy.

The patient had been living alone and had significant comorbidities. She was affected by metabolic syndrome (diabetes, obesity and hypertension), carotid atherosclerosis, atrial fibrillation, dilated cardiomyopathy, chronic renal insufficiency, COPD, hypothyroidism and chronic anaemia of multi-factorial aetiology. While she did not have a history of cognitive decline taking into account her risk factors she could probably have a grade of cerebral vasculopathy which could compromise her ability to properly assume her prescribed therapy.

In March 2015, she was hospitalized in our geriatric ward for exacerbation of chronic heart failure and hypokalaemia. When she was admitted we found very difficult to collect her pharmacological anamnesis due to the acute pathologies which also compromised her cognitive state. With the help of her relatives who took pictures of the patient's pill boxes at her flat we discovered that her home drug therapy was full of errors. She took both heparin (at an unknown dosage) and acenocumarol and a dosage of diuretic and proton pump inhibitor therapy which was too elevated (see table 1 below).

We infer that the errors in the drugs intake contributed to the frequent patient hospitalization in the recent year (4 hospitalizations for cardiac and acute renal insufficiency, 1 admission to rehabilitation and 1 admission to emergency department (A&E) for dyspnoea).

When the patient was clinically stable we performed a mini mental state examination (MMSE) which was indicative of cognitive decline (score of 22/30, cut off at 24/30) and confirmed that the patient was unable to take her medicaments properly on her own. Unfortunately, this situation (i.e., wrong therapy intake while at home) is very common among elderly people who frequently suffer from many pathologies, live alone and have an undiagnosed initial cognitive impairment. We believe it is critical to:



- a) Reduce the number of prescribed drugs (polytherapy *per se* is a risk factor for functional decline and increases mortality).
- b) Carry out an adequate medical reconciliation at the hospital discharge - also involving the patient doctor - with clear dosage for home treatment.

Drug	Dose	Frequency
Insulin glargine	100 UI/ml	Unknown dosage
Acarbose	50 mg	1 cp x 3
Potassium chloride	600 mg	1 cp
Furosemide	25 mg	1 cp on Saturday's and Sunday's
Furosemide	500 mg	1 cp x 2
Allopurinol	300 mg	1 cp
Levothyroxine	50 mcg	1 cp
Irbesartan	300 mg	1 cp
Bisoprolol	1.25 mg	1 cp
Pantoprazole	40 mg	2 cp + 1 cp
Acenocoumarol	1 mg	1 cp
Unfractionated Heparin	5000 UI/0.2 mL	Unknown dosage

Table 1

Readmission in Internal Medicine: Individual and Healthcare Factors

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The demographic trend towards an aging population, associated with an increase in chronic diseases are a major challenge for all health care systems, which are required to quickly update their response to a demand growing exponentially. Internal medicine is heavily exposed to this problem. Readmissions are an indicator of the effectiveness of health care. The frequency of readmissions can be reduced by improving the effectiveness of hospital care and care planning; a major role is played by the interface with the family and social environment.

OBJECTIVE

We examined the patients who required hospitalization within one month from previous hospital discharge. We analyzed the elements of fragility, the organizational context activated at discharge, the presence of the critical elements in the interaction between the hospital/territory; lastly we identified the areas of improvement.

SETTING AND PARTICIPANTS

We conducted a retrospective analysis of 89 cases of re-hospitalization occurred in 2014 at the Division of Internal Medicine Hospital of Bobbio (Piacenza, Italy). We considered cases of readmission within one month from previous discharge from the same hospital. We collected data directly from the medical records of each patient.

MAIN OUTCOME MEASURES

We investigated the following factors: data and information concerning the residential environment; condition of frailty before the event; data characterizing the first hospitalization; characteristics of first discharge; presence of major care factors (pressure lesions, assisted or parenteral nutrition, oxygen therapy, the number of prescribed drugs and the number of daily doses); the data for the second admission to the hospital and the second discharge; detecting possible signs of inadequate home management; hypothesis of possible identified improvement action.

RESULTS

In our series, readmissions (occurred within one month from the previous discharge for any cause) occurred in 12.24% of cases. Men (49%) had an average age of 78 years, women (51%) an average age of 83.5 years. They presented conditions of isolation in 14% of cases; 7% was host of an institution. Only 15% were



self-sufficient before admission; 85% carried a variable degree of dependency.

Discharge from the first hospitalization was oriented to sending home 70% of cases. In 73% of cases a number of diseases (>4) were detected; in 80.5% a number of medications were prescribed at discharge (>5).

The disorder responsible for repeated admission was due to the same MDC that had caused previous hospitalization, in 52% of cases: it follows that the real readmissions, in our population, were 42 cases out of a total of 727 admissions (5.8%).

In each case, we weighed the possible critical factors in managing home care: in 28% of cases, readmission was independent of social organization and health; in 12% of cases was found inadequate logistics and home environment; 6% prevailed insufficient patient compliance; in 53% of cases, inadequate monitoring on the health and social care.

CONCLUSIONS

Readmissions represent an easily measurable indicator of a growing difficulty in the management of health problems related to an aging population. A growing proportion of the population suffering from many chronic diseases takes many medications and live in conditions of isolation and fragility.

This work wants to provide discussion points rather than definitive information and guidance. In this perspective, we identified, for each case, the possible field of remedial work in the course of patients treatment: in 34% of cases we identified as a priority to invest on activation/enhancement of protected discharge; in 23% of cases it was a priority work on the interface Hospital-Territory to increase continuity of care (routes for frail patients, sharing of acceptance hospital); in 25% of cases we considered inevitable to admit the patient in a dedicated institute; in 18% of cases we found room for improvement in home care.

We aim to discuss these data and these observations with social-health professionals involved in the difficult management of the increasing number of patients with multiple chronic diseases.

Are Older People with Diabetes an At-Risk Group for Falls? A Cross-Sectional Analysis of Community-Dwelling Adults ≥ 50 Years in Ireland

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Falls are a common and serious concern facing older adults and the prevalence is increasing internationally. Falls lead to injury, hospitalisation, and substantial healthcare costs. Older people with diabetes may be at increased risk of falls, given the potential for polypharmacy and the development of microvascular complications. We aimed estimate prevalence of falls and examined the association between diabetes and a risk of falls in the older population using The Irish Longitudinal Study of Aging (TILDA).

Cross-sectional analysis was conducted on the first wave of TILDA data (2009-2011): a nationally representative sample of community-dwelling adults aged ≥ 50 years. Data were collected using a computer-assisted personal interview, self-completion survey and health assessment. Diabetes was based on self-report of doctor diagnosis, the prevalence of falls in the previous year was also ascertained by self-report. The relationship between diabetes and falls risk was assessed using Pearson's Chi-squared test. Multivariate poisson regression was used to examine the association between diabetes and falls, adjusted for age, sex, polypharmacy (≥ 5 different medications) and multimorbidity (≥ 2 chronic illnesses).

In the sample ($n=8175$), the prevalence of falls in those with diabetes was 24% ($n=152$ 95% CI:21-28%; $p<0.05$) compared to 19% ($n=1431$ 95% CI:18-20%; <0.05) in those without diabetes. When adjusted for age and gender, diabetes was significantly associated with an increased risk of falling (IRR: 1.23 95% CI: 1.04-1.45%; $p<0.05$). Age and female gender were significantly associated with an increased risk of falls in older people (age: IRR: 1.02 95% CI: 1.01-1.03%; $p<0.05$; sex: IRR: 1.12 95% CI: 1.01-1.23%). Polypharmacy (IRR: 1.24 95% CI: 1.09-1.42%; $p<0.05$) and multimorbidity (IRR: 1.30 95% CI:1.11-1.54%; <0.05), were also both significantly associated in age- and sex-adjusted model with falls. Upon their addition to the final model, there was a marked reduction in the association between diabetes and increased risk of falls (IRR: 1.02 95% CI: 0.85-1.22%; $p=0.834$).

One-quarter of adults with diabetes experienced a fall in the preceding year. Our analysis showed an association between those who had fallen at least once in the previous year with

diabetes, adjusted for age and gender. The relationship was not significant after adjustment for polypharmacy and multimorbidity. Given the potential for multimorbidity and polypharmacy in this group, people with diabetes may benefit from early recognition of their fall-risk and interventions to reduce risk.

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