Clinical pharmacy

CP-001 IMPACT OF A PHARMACEUTICAL CARE PROGRAMME FOCUSED ON SOLID ORGAN TRANSPLANT PATIENTS

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Background Patient and organ survival is dependent on the use of immunosuppressant drugs. The doses are reduced several months after the surgery to low maintenance phase levels. Treatments are complex and require drug treatment monitoring.
Purpose To analyse the impact of a Pharmaceutical Care Programme focused on solid organ transplant patients for the prevention and correction of drug-related problems (DRPs). DRPs include medication errors in the process of prescribing, dispensing or administering a drug.
Material and methods Study design: retrospective observational study. Sample: 222 solid organ transplant patients: 94 kidney (9 with pancreas), 31 lung, 86 liver and 19 heart. The IASER method (identify, act, monitor, evaluate and results) was used as a tool to analyse and categorise the DRPs. Variables: number and type of DRP, drugs, recommended actions, acceptance and cost savings (acquisition drug cost, preparation and administration time cost, GRD cost, etc.
Results 125 DRPs were detected in 88 patients (0.5 problem/solid organ transplant patient). 60.8% of the patients were males and the average of age was 53 years (7–86). Identified by validation (71.2%) and analytical parameters (24.0%). 41.6% of DRPs reached the patient. The main problems were over dosage (24%) in kidney transplant and (8%) in liver transplant patients, the need for additional treatment (12%) in lung transplant and (1.6%) in heart transplant patients. The DRPs were categorised into safety (45.6%), indication (33.6%), effectiveness (18.4%) and adherence (2.4%). The therapeutic groups involved were mainly antibiotics (50%) and immunosuppressants (26%). 81.6% of the actions were accepted by physicians. 72% were relevant to improving patient care. The financial impact was €69,826/year saved (€38,123/year in kidney transplant, €19,106/year in lung transplant, €9,658/year in liver transplant and €2,939/year in heart transplant patients).
Conclusion Management of complex treatments requires the involvement of all health professionals. A pharmaceutical care programme based on pharmacotherapeutic monitoring resolved DRPs in solid organ transplant patients. It improved the quality of treatment and saved money.

REFERENCES AND/OR ACKNOWLEDGEMENTS

No conflict of interest.

CP-002 PHARMACEUTICAL CARE SYSTEM FOR LIVER TRANSPLANT PATIENTS USING ELECTRONIC CONSULTATION

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Background Information and education for transplant patients can improve their health outcomes. Communication between health professionals through the electronic medical record is used in the management of hospitalised patients.
Purpose To evaluate a pharmaceutical care program in liver transplantation patients through electronic consultation.
Material and methods Setting: tertiary hospital of 1,000 beds. Design: observational prospective study. Population: 90 liver transplant patients during 2013. System: the physician requests the pharmacist consultation via the electronic medical record. The pharmacist delivers the documentation and training to the patient in collaboration with the medical and nursing team. At discharge, the pharmacist gives education about drugs by an informative newsletter and planning schedule. One week after discharge, he telephones the patient to complete a survey on the training level and satisfaction. Variables: patient characteristics, diagnosis, treatment, level of understanding and satisfaction.
Results During the study period, 63 patients met the criteria for inclusion in the system. 100% of the consultations were performed and recorded. (Median; range): 57 years (26–69); 80% male; stay: 14 days (8–60); number of diseases contributing to the patient's condition: 2.5 (1–9); drugs at admission: 5.5 (0–14); drugs at discharge: 10 (5–10). The main reason for transplantation was viral hepatitis: HCV (58%), HBV (14%), alcoholic cirrhosis (30%) and hepatocellular carcinoma associated with previous cases (14%). 31 surveys were obtained with a level of understanding 4.8 out of 5. 90% of patients used the schedule delivered. 58% claimed to know what it was for each drug, 90% were not confused with taking the medicines and 97% did not forget to take their medicines. Finally, 97% said they were satisfied with the information received.
Conclusion The participation of a pharmacist in this system can contribute to a better understanding of the treatments by the transplant patient. Electronic consultation has proved a useful and efficient tool for coordinating activities among professionals involved.

REFERENCESS AND/OR ACKNOWLEDGEMENTS

No conflict of interest.

CP-003 CLINICAL PHARMACIST INTERVENTIONS ON PARENTERAL NUTRITION APPROPRIATENESS IN A TEACHING HOSPITAL

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Background Total Parenteral Nutrition (TPN) isn't always prescribed according to international guidelines: nutritional screening is frequently lacking, the prescribed therapy is not always adapted accordingly and subsequent monitoring is often absent. Our objective was to assess the potential benefit of a clinical pharmacist reviewing prescribed TPN.
Purpose Evaluation of the appropriateness of prescribed TPN.
Material and methods Setting: A prospective pre-post intervention study in a tertiary care teaching hospital with a high percentage of cancer and critically ill patients.

Method: Adult hospitalised patients on TPN were included. The presence of a Nutritional Risk Screening-2002 and the calculation of energy requirements, the indication, the therapy appropriateness and the therapy duration were assessed by a

clinical pharmacist. During the intervention period feedback was provided to the physician and dietician in multidisciplinary collaboration. The ESPEN guidelines were taken as golden standard. All data were obtained from the electronic patients files.
Results We assessed 272 hospitalisations, 152 pre-interventional (10/2013–01/2014) and 120 post-interventional (02/2014–04/2014). During the latter period an intervention was needed in 83.7% (176 interventions) of the cases. Prevalence of nutritional screening increased from 25.0% to 61.7% ($p < 0.001$) as did energy requirement calculation (30.9% vs. 67.5%; $p < 0.001$). Therapy appropriateness increased from 58.8% to 75.8% ($p < 0.05$). The median duration (6.0 vs. 7.0 days) of the therapy was not significantly reduced ($p = 0.36$). We avoided the production of at least 81 TPNs on a total of 1172. During the 3 month intervention period an estimated total saving of 20756€ could be obtained.
Conclusion The additional monitoring of the appropriateness of TPN by a clinical pharmacist has a positive influence on therapy quality and healthcare costs.

REFERENCES AND/OR ACKNOWLEDGEMENTS

1 ESPEN guidelines (http://www.espen.org/education/espen-guidelines)
2 Nutrition support team

No conflict of interest.

CP-004 AGE-RELATED MACULAR DEGENERATION: ECONOMIC IMPACT OF IMPLEMENTING TREATMENT GUIDELINES

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Introduction
Background Drugs for age-related neovascular macular degeneration (AMD) reverse the disease process, usually leading to gains in visual acuity. Ranibizumab (Lucentis) was licensed for AMD in the EU in 2007. Bevacizumab (Avastin), has been widely used globally off-label by splitting up doses licensed for cancer.
Purpose To assess the use and cost of intravitreal ranibizumab and bevacizumab, after the implementation of AMD treatment guidelines.
Methods A retrospective analysis of the use of both drugs in our hospital from 2007 to 2013 was conducted. At the end of 2009 AMD treatment guidelines were implemented in our hospital: ranibizumab 0.5 mg only can be prescribed after poor response to three monthly injections of bevacizumab 1.25 mg.
Results A total of 494 doses of ranibizumab were administered to 107 patients. Bevacizumab was administered to 418 patients with a total of 1325 doses.

Prescriptions for each drug were as follows (from 2007 to 2013):

- Ranibizumab: 23, 147, 179, 32, 27, 25, 61.
- Bevacizumab: 0, 56, 63, 204, 259, 340, 403.

In 2010 after the implementation of the protocol, ranibizumab prescriptions decreased 82.1%, from 179 (2009) to 32 (2010). Bevacizumab prescriptions increased 223.8%, from 63 (2009) to 204 (2010).

Ranibizumab injection average cost was €985.69 per injection. Each bevacizumab injection cost €16.40. Ranibizumab costs in the whole seven year period were €486,929. Bevacizumab costs in the same period were €21,730. Global saving costs for implementing this protocol in our hospital were €1,151,128.
Conclusions Our study showed that considerable savings may be obtained by promoting the most cost-effectiveness alternative as first line treatment for AMD. The role of hospital pharmacists was crucial, involving the process of splitting up bevacizumab doses.

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1 CATT Research Group, Martin DF, Maguire MG, *et al*. Ranibizumab and bevacizumab for neovascular age-related macular degeneration. *N Engl J Med* 2011;**364**:1897–908

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CP-005 ASSESSMENT OF DRUG-DRUG INTERACTIONS INVOLVING PSYCHIATRIC AGENTS IN HOSPITALISED PATIENTS

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Background The use of psychiatric agents in hospitals increases the complexity of pharmacotherapy and the risk of drug–drug interactions.
Purpose To assess the frequency and clinical relevance of interactions associated with the use of antipsychotics, anxiolytics, antidepressants and sedative/hypnotics in a hospital.
Material and methods Cross-sectional observational study in which the treatment of adult patients admitted to a general hospital (1,350 beds) was reviewed. The investigators, using a computerised physician order entry program, evaluated pharmacotherapy of inpatients involving antipsychotics, anxiolytics, antidepressants and sedatives/hypnotics. They assessed drug-drug interactions and their clinical significance as described in the literature. Reference sources were the Micromedex database and the Spanish Society of Hospital Pharmacist's professional guide to drug interactions.
Results Treatment of 393 patients was analysed. Of these, 179 (45.5%) were prescribed one of the drugs studied; 53.6% were female and 46.4% male with mean age 65 (SD ± 17.7) years. The average number of drugs prescribed per patient was 12 (SD ± 4.41). A total of 221 drug interactions was detected (9.5% pharmacokinetic, 90.5% pharmacodynamic), affecting 70.4% of patients. A total of 42.8% were due to prescription of antipsychotics, 31.1% due to antidepressants, 18.5% to anxiolytics and 7.6% to hypnotics/sedatives. The medical specialties involved were surgery (22.4%), oncology (11.1%), cardiology (8.9%), internal medicine (8.9%) and psychiatry (8.4%). Based on clinical significance, 47.5% of interactions were severe, 25.3% moderate and 27.1% mild. Potential interactions with significant clinical effects were haloperidol-tramadol (increased seizure risk), escitalopram-low molecular weight heparin (increased risk of bleeding) and midazolam-morphine (increased sedation). Three contraindicated combinations were detected: escitalopram-metoclopramide for increased QT interval, linezolid-amitriptyline for serotonin syndrome and risperidone-metoclopramide for neuroleptic syndrome and extrapyramidal reactions.
Conclusion Prescription of antipsychotic drugs, antidepressants, anxiolytics and sedatives/hypnotics to inpatients is very common. These drugs cause numerous drug interactions, which can potentially have serious consequences for hospitalised patients.