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The cost of treating cancer patients with antineoplastic medications during inpatient hospital admission

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Pharmacoeconomics/Outcomes

533. The cost of treating cancer patients with antineoplastic medications during inpatient hospital admission *Alexandra Foster, Pharm.D. Candidate¹, David Reeves, Pharm.D., BCOP²; (1) College of Pharmacy and Health Sciences, Butler University (2) St. Vincent Indianapolis Hospital and College of Pharmacy and Health Sciences, Butler University*

PURPOSE: Cancer treatment represents a substantial portion of health care costs and is projected to increase by twenty-seven percent from 2010 to 2020, with total costs reaching 158 billion dollars per year. Due to these projections, it is imperative for institutions to implement cost saving strategies, as well as maximize reimbursement. The objective of this study is to evaluate the cost and necessity of providing chemotherapy regimens in the inpatient setting and explore the savings associated with implementation of a policy defining the appropriate indications for the use of inpatient chemotherapy.

METHODS: A retrospective chart review of adult patients receiving inpatient chemotherapy during January, April, July, and October of 2010, 2012, and 2014 at St. Vincent Hospital in Indianapolis is in progress. Demographic data, chemotherapy regimens (cycle number, dosing, schedule, agents, and routes of administration), prior adverse effects, reasons for inpatient chemotherapy, and cost of chemotherapy regimens (average wholesale price) are being collected. Necessity of inpatient chemotherapy will be determined based on adherence to the available guidelines for inpatient chemotherapy. Institutional review board approval was received on August 27, 2013.

RESULTS: Records of 415 patients receiving chemotherapy during ten of the twelve intended months have been retrospectively reviewed. Data collection for July and October 2012 are currently in progress. Preliminary results indicate the annualized number of patients receiving chemotherapy in the inpatient setting decreased from 579 patients in 2010 to 381 patients in 2014, while the annualized number of patients admitted specifically for chemotherapy decreased from 327 patients in 2010 to 189 patients in 2014. Financial and statistical analysis will be conducted upon completion of data collection.

CONCLUSION: Preliminary data suggests the number of patients receiving inpatient chemotherapy and the number of patients admitted specifically for chemotherapy decreased after implementation of a policy in 2014 regarding appropriate inpatient chemotherapy use.

534. A cost-savings analysis of a pharmacy internship program in a hospital inpatient setting *Lana Al-Omar, Pharm.D. Candidate, Daniel Galipeau, Pharm.D. Candidate, Kristi Smith, Pharm.D. Candidate, Michelle Sugden, Pharm.D. Candidate, Kristi Bronkan, Pharm.D., BCPS, Corrie Vasilopoulos, Pharm.D., BCPS; Denver Health Medical Center*

PURPOSE: Pharmacy internship programs provide the opportunity for pharmacy students to work and learn in a pharmacy practice setting, however, there is scarce published data to demonstrate the value of a pharmacy internship program to either the pharmacy student or the institution. This study is the first in a series of studies to assess the overall benefit of pharmacy internship programs, specifically in the hospital inpatient setting. The goal of this study is to assess the financial benefit of an inpatient pharmacy internship program involving both clinical and operational roles.

METHODS: The financial value of clinical services provided by interns was calculated using intervention data from August 2013 to April 2015. The savings from interns performing clinical work as compared to pharmacists were determined using the total time spent on interventions and comparing the midpoint hourly wage for interns and pharmacists. The savings from operational services provided by interns was calculated using total hours of intern operational work and comparing the midpoint hourly wage for interns and pharmacy technicians.

RESULTS: The overall value of clinical services provided by interns was \$206,230 annually. The cost difference between interns providing clinical services as compared to pharmacists was \$13,960 annually. The cost savings associated with interns providing operational services was \$11,440 annually. Results at this time are undergoing final analysis to compile graphical data.

CONCLUSION: There is a significant financial benefit to a hospital institution for supporting a pharmacy internship program. This financial benefit should reassure hospitals that developing, promoting and sustaining a pharmacy internship program provides value to the organization. Further research is needed to elucidate the benefits of a pharmacy internship program to pharmacy students and determine what aspects of a pharmacy internship program are most beneficial to pharmacy students.

Pharmacogenomics/Pharmacogenetics

537. Effects of CYP2D6 genetic polymorphisms on the pharmacokinetics of tramadol and its active metabolite *Hye-Jin Lim, B.S., Dong-Hyun Kim, B.S., Young-Hoon Kim, B.S., Se-Hyung Kim, Ph.D. Candidate, Ji-Yeong Byeon, B.S., Seok-Yong Lee, Ph.D.; School of Pharmacy, Sungkyunkwan University, Suwon, South Korea*

PURPOSE: Tramadol is a synthetic μ -receptor agonist used for the relief of moderate to severe acute and chronic pain. Tramadol is mainly to O-demethyltramadol (ODT) metabolized in the liver. Also tramadol itself possesses serotonin and norepinephrine reuptake blocking activity. CYP2D6 is responsible for the metabolism of approximately 25% of clinically used drugs and especially *CYP2D6*10* allele is accounted for 50% of *CYP2D6* allele in Asian. We investigated the effects of *CYP2D6*10* allele on the pharmacokinetics of tramadol and its active metabolite.

METHODS: Thirty healthy Korean volunteers with *CYP2D6*wt/*wt* (**wt* = *1 or *2, $n = 10$), *CYP2D6*wt/*10* ($n = 10$) and *CYP2D6*10/*10* ($n = 10$) were selected for this study. Each volunteer received a single oral dose of 100 mg tramadol after overnight fasting. Blood samples were collected up to 30 hour after drug intake, and plasma concentrations of tramadol and its metabolite were determined by using LC-MS/MS analytical system.

RESULTS: AUC_{inf} of tramadol in *CYP2D6*10/*10* group was higher than those in *CYP2D6*wt/*wt* genotype group; 3237.3 ± 765.7 ng*hour/mL and 2146.4 ± 407.2 ng*hour /mL ($p < 0.001$). But C_{max} tramadol was not significantly different among three different groups. In terms of O-demethyltramadol (ODT), AUC_{inf} in *CYP2D6*10/*10* group was lower than those in *CYP2D6*wt/*wt* genotype group; 882.7 ± 274.0 ng*hour/mL and 1173.9 ± 165.9 ng*hour/mL ($p < 0.001$).

CONCLUSIONS: In conclusion, *CYP2D6*10* allele has significant effects on the pharmacokinetics of tramadol and its active metabolite.

538. Effects of CYP2C9*13 allele on the pharmacokinetics of Irbesartan *Hye-Jin Lim, B.S., Dong-Hyun Kim, B.S., Ji-Yeong Byeon, B.S., Young-Hoon Kim, B.S., Se-Hyung Kim, B.S., Ph.D. Candidate; School of Pharmacy, Sungkyunkwan University, Suwon, South Korea*

PURPOSE: Irbesartan is an angiotensin II antagonist that selectively blocks the binding of angiotensin II to the AT1 receptor, and is used for the treatment of hypertension, as well as diabetic nephropathy with an elevated serum creatinine and proteinuria in patients with type 2 diabetes and hypertension. Irbesartan is metabolized by polymorphic CYP2C9 to inactive metabolite. *CYP2C9*13* allele show impaired activity towards a number of substrates both in vitro and in vivo. Unlike *CYP2C9*3*, which has been extensively studied in humans, clinical studies of *CYP2C9*13* have been limited by the difficulty in finding subjects carrying this low-frequency allele. We evaluated the effect of *CYP2C9*13* allele on the pharmacokinetics of irbesartan in healthy volunteers.

METHODS: In this study, we enrolled 1907 healthy Korean subjects and divided into four different groups according to *CYP2C9*