MSHP Pharmascript

Volume 45, Issue No. 1
Supplement 1
First Quarter

Special Edition: 2021 Pharmacist and Student Abstracts

Table of Contents

Long-term Medication Adherence

Ricardo Gaitan, PharmD Candidate; Royce Burruss, RPh, MBA, Corporate Director of Clinical Services - Biomatrix Specialty Pharmacy

Objective: To determine if an association exists between patient-reported overall health rating and adherence to prescribed deutetrabenazine therapy.

Methods: A retrospective, pilot study was designed using data from August 1 through October 31, 2020. Data were obtained from a specialty pharmacy's pool of neurology patients who had a diagnosis of Huntington's Disease with chorea (HDC) or tardive dyskinesia secondary to antipsychotic medications (TDD) to whom oral deutetrabenazine was administered by the patient or a caregiver and who agreed to participate in the medication therapy management program. Sample size for the pilot study was 27 patients with 16 (59%) HDC and 11 (41%) TDD. Patient-reported Overall Health Score rating of the EQ-5D-5L Quality of Life (QoL) instrument was determined, using a 0-100 visual analog scale. Medication Possession Ratio (MPR) was used as the medication adherence metric. Specialty pharmacy provided medication therapy management-related patient assessments were completed at the start of care and repeated approximately 7 days prior to the next prescription fill. Acceptable medication adherence was set at ≥ 90% MPR. Linear regression was used for data analysis and this included an F-test for Goodness of Fit of data, as well as the Shapiro-Wilk test of normality of residual distribution. Patients received either 30-day or 90-day prescription fills, and this was taken into account when calculating individual patient MPR.

Pharmascript
Volume 45, Issue No. 1
Supplement 1
First Quarter

Results: Linear regression of calculated MPR versus Overall Health Score illustrated a moderate inverse correlation that was statistically significant (R=-0.41, R2=0.17, p=0.03). The regression residuals were analyzed using the Shapiro-Wilk test and the residuals were determined to be normally distributed.

Conclusions: These results were informative as it demonstrates a moderate inverse relationship between OAH QoL score and adherence to deutetrabenazine therapy. One possible explanation is that the patients who report lower QoL may pay more attention to taking their medication as prescribed than are those who feel well who may be less attentive to the need for optimal adherence. This pilot study of neurology patients suggests that additional research should be done to provide further clarification on the association between patient-reported Overall Health Score QoL and adherence to chronic medication therapy.

Trust-related Issues Surrounding COVID-19 Diagnostic Testing in Underrepresented Populations and Communication Strategies to Build Trust

Shima Lahouti, PharmD Candidate; C. Daniel Mullins, PhD

Objectives: The purpose of this review is to explore how COVID-19 diagnostic testing is perceived among underrepresented populations, their concerns regarding being tested, and how communications should be provided to create trust surrounding testing.

Methods: A grey literature search was performed using a variety of databases, including PubMed, Embase, Google Scholar, Scopus, and MedRxiv. Medical Subject Headings terms included COVID-19 testing, ethics, trust, minorities, and communication.

Results: Distrust in the healthcare system, disinformation about the disease, and lack of transparent communication about how personal data is handled have caused underrepresented communities to feel unsafe about testing. Also, lack of community engagement, structural inequalities, and inequitable access to COVID-19 testing across social and economic groups have caused loss of trust. Furthermore, fear of deportation if getting tested among undocumented populations, fear of losing income if tested positive, along with fear of unexpected fees from testing have been delaying access to needed services.

Engagement of leaders of marginalized communities in health policymaking, availability of multilingual messaging that is also tailored to needs of underrepresented populations, providing comprehensive education about how to be tested, and delivering messages through trusted leaders from within the communities can help build trust and cultural competence in COVID-19 testing.

Conclusions: Understanding the dynamics of distrust is key for increasing engagement in COVID-19 testing. Literature identified trust concerns and focused on distrust in the healthcare system, structural inequalities, and lack of transparent communication as key factors that foster mistrust. To address these, various communication strategies have been proposed. Engaging trusted community leaders in policymaking and in delivering messages to the community and communicating messages in variety of languages are effective approaches to increase accessibility to testing and improve health outcomes during the COVID-19 pandemic.

Pharmascript

Volume 45, Issue No. 1
Supplement 1
First Quarter

Age Friendly Readiness Survey: Understanding the Needs of Primary Care Providers

Brian S. Lee, PharmD Candidate 2021; Jennifer A. Woodard, MD; Amanda Guth; Joshua Chou, PharmD; Nicole Brandt, PharmD, MBA

Purpose: As the older adult population continues to increase, so will their healthcare needs. MedStar Health's Center for Successful Aging has joined the Institute for Healthcare Improvements' Age-Friendly Health Systems (AFHS) initiative. In AFHS, older adults receive care based on the 4M framework (What Matters, Medication, Mentation, and Mobility). This study aims to investigate the readiness of healthcare professionals for the implementation of an AFHS.

Methods: A 50-item online survey was released to 244 MedStar healthcare professionals in the Baltimore area, starting December 2019 to July 2020. It included those who practiced within a primary care setting and excluded those without direct patient contact. Questionnaire items addressed provider type, frequency of screening or assessment, and comfort in utilizing 4M. Responses were analyzed using descriptive statistics for demographic and Likert scale questions and thematically categorized free-text responses using content analysis.

Results: The survey response rate was 25/244 (10.2%), which included physicians (60%), pharmacists (36%), and nurse practitioners (4%). The frequency of healthcare professionals asking about the 4M framework (goals of care, full medication reconciliation, mobility, depression, and dementia) was 64% with at least twice a year, 88% at every visit, 84% at least twice a year, 72% at least twice a year and 44% at least twice a year, respectively. Healthcare professionals answered that they felt "very comfortable" using the 4M framework to assess outcome goals and care preferences (76%), identifying high-risk medications (100%), mobility (56%), depression (76%), and dementia (48%).

Conclusion: Findings emphasized that most healthcare professionals frequently assessed older adults using the 4M framework and felt comfortable in utilizing most of its components, except for dementia. This study may assist in identifying educational opportunities for healthcare professionals regarding the 4M framework.

Evaluation of Acute Kidney Injury Rates with Linezolid Versus Vancomycin for Obese Patients with Severe Skin and Soft Tissue Infections

Favour Eluma, PharmD Candidate; Kimberly Claeys, PharmD; Alison Blackman, PharmD; Emily Heil, PharmD

Purpose: Vancomycin is commonly used as empiric treatment for severe skin and soft tissue infections (SSTIs) due to its coverage of common SSTI pathogens including methicillin-resistant Staphylococcus aureus (MRSA). A well-described potential adverse effect of vancomycin is acute kidney injury (AKI). Linezolid is an appealing alternative to vancomycin for severe SSTI as it also provides coverage of MRSA and is not associated with AKI. Risk of AKI is multifactorial and high in obese patients with severe SSTIs, such as necrotizing fasciitis. The purpose of this study was to compare the rates of AKI in obese patients that received vancomycin versus linezolid for severe SSTIs to determine if linezolid may be a safer option in this patient population.

Methods: This was a retrospective cohort study of obese patients (BMI of 30 kg/m2 or greater) that received either IV linezolid or vancomycin for at least 72 hours for severe SSTI at the University of Maryland Medical Center from December 1, 2015 to July 28, 2018. Patients were excluded if pregnant or on renal replacement therapy at the start of antibiotic therapy. Severe SSTI included toxic shock syndrome, necrotizing fasciitis, gas gangrene or SSTI with severe sepsis or septic shock. AKI was defined as a serum creatinine increase of at least 0.5 mg/dL or at least 50% from baseline

during or up to 7 days after antibiotic therapy. The primary objective was to compare the rate of AKI in patients receiving linezolid versus vancomycin. Data analysis included descriptive statistics and AKI incidence was evaluated with Fisher's Exact Test with $p < 0.05$ being statistically significant.

Results: A total of 185 patients were included in this study with 143 receiving vancomycin and 42 receiving linezolid. Patients were on average 53 years of age, primarily male (62%), with a mean BMI of 41 kg/m2. The most common severe SSTIs included cellulitis with sepsis (35%), necrotizing fasciitis (32%), Fournier's gangrene (17%), and abscess with sepsis (10%). The mean baseline serum creatinine for all patients was 1.24 ± 1.04 mg/dL. More patients in the linezolid group had AKI at baseline (23%) compared to vancomycin (11%). Numerically more patients developed AKI during treatment with vancomycin (2.7%) compared to linezolid (0%) (p=0.57).

Conclusions: The use of linezolid for severe SSTIs in obese patients was not associated with a significant reduction in AKI versus vancomycin, although rates of AKI across both groups were very low. Risk of AKI in obese patients with severe SSTI is often multifactorial (e.g., multiple operations, significant fluid losses, other concomitant medications) so the choice of antibiotics alone may not be the sole driver of AKI risk.

Conversion from Immediate Release Tacrolimus to Extended Release Tacrolimus in Abdominal and Thoracic Organ Recipients

N. Agarwal, A. Younas, I. Shah, A. Diamond, C. Ruggia-Check, J. Au, N. Sifontis

Introduction: An established approach for conversion from immediate-release tacrolimus (IR TAC) to extended-release tacrolimus (LCPT) in kidney transplantation exists, but is lacking in other organ populations. Due to recent shortages of IR TAC, an increase in use of LCPT has been seen in all organ populations. To broaden our understanding of the optimal approach in converting from IR TAC to LCPT, the purpose of this study is to identify differences in conversion ratios amongst all organ populations compared to current conversion recommendations.

Methods: One hundred twenty-four transplant recipients were included (43 kidney, 8 kidney/pancreas, 6 liver, 17 heart, and 50 lung). The primary outcome was the conversion ratio from IR TAC to LCPT required to achieve therapeutic TAC trough levels. Secondary outcomes included pre-conversion dosage, dosage at time of therapeutic TAC trough level, and serum creatinine (SCr) at time of therapeutic TAC trough level.

Results: Mean age at transplantation was 59.9 ± 11.8 years (Table 1). A lower mean age and a higher percentage of African American and Hispanic patients were noted in the abdominal organ transplant (AOT) population compared to the thoracic transplant population. Ethnicity was self-reported. At conversion, 72% of patients were at a therapeutic TAC trough level. The mean conversion ratio at time of conversion from IR TAC to LCPT was 1:0.91 for all organ populations. At the time of achieving therapeutic TAC trough levels, the mean conversion ratio required to reach therapeutic level was 1:0.91 with lower median conversion ratios required in thoracic transplant recipients (1:0.81 for heart and 1:0.79 for lung) compared to AOT recipients (1:1 for kidney, 1:1 for kidney/pancreas, and 1:0.95 for liver). A longer than desirable time to therapeutic level was noted, which may be due to varying frequency in checking TAC trough levels. No notable changes in mean SCr at conversion were observed (1.46 mg/dL vs. 1.57 mg/dL).

Conclusions: Our findings suggest that different dosing conversion requirements may be warranted depending on the type of organ transplant received. A higher percentage of African American and Hispanic patients in the AOT population may have led to higher dosing requirements of LCPT in this cohort. Organ type, age, and ethnicity should be taken into

consideration when determining conversion factors from IR TAC to LCPT. Further prospective research is needed to confirm these findings.

Table 1.

	All Patients (N= 124)	Kidney (N= 43)	Lung (N= 50)	Heart (N= 17)	Kidney/Pancreas (N= 8)	Liver (N= 6)
Age (years), mean ± SD	59.9 ± 11.8	57.1 ± 11.5	65.3 ± 8.8	61.4 ± 10.7	45.3 ± 13.2	54.8 ± 12.4
Ethnicity, n (%)						
White	62 (50)	11 (26)	39 (78)	9 (53)	0 (0)	3 (50)
Black	46 (37)	22 (51)	9 (18)	7 (41)	5 (63)	3 (50)
Hispanic	14 (11)	8 (18)	2 (0.04)	1 (0.06)	3 (38)	0 (0)
Mean pre-conversion IR TAC daily dose (mg/day), mean ± SD	6.73 ± 4.27	6.72 ± 3.82	6.64 ± 4.39	5.32 ± 2.88	8.12 ± 6.83	9.75 ± 4.86
Median initial conversion ratio (IR TAC : LCPT), mg : mg	1 : 0.9	1 : 1	1 : 0.8	1 : 0.8	1 : 1	1 : 1
Median conversion ratio at time of achieving targeted TAC trough level (IR TAC : LCPT), mg : mg	1 : 0.89	1 : 1	1 : 0.79	1 : 0.81	1 : 1	1 : 0.95
Mean LCPT dose, (mg/day), mean ± SD						
At conversion	6.09 ± 4.23	6.61 ± 4.45	5.5 ± 3.51	4.5 ± 2.51	8.25 ± 7.17	9 ± 5.37
Post-conversion at therapeutic level	5.95 ± 4.06	6.49 ± 4.04	5.29 ± 3.54	4.34 ± 2.38	8.5 ± 7.11	8.83 ± 7.5
Time to achieve therapeutic level (days), mean	49.9	68.7	24.3	55.8	54.3	108.1

Clinical Efficacy of Methylsulfonylmethane in Providing Symptomatic Relief of Musculoskeletal Pain Associated with Osteoarthritis: A Literature Review

Brian S. Lee, PharmD Candidate 2021; Catherine Kim, PharmD Candidate 2022; SeJeong Yoon, PharmD; Ashlee N. Mattingly, PharmD, MPH, BCPS

Purpose: Osteoarthritis (OA) is the most common form of arthritis, especially prevalent in older adults. Standard treatments include nonsteroidal anti-inflammatory drugs, acetaminophen, and steroids but may result in major side effects (SE). Methylsulfonylmethane (MSM) is a supplement with anti-inflammatory effects with minimal SE and may be used as an adjunct therapy. This study aims to review the literature regarding the benefits of MSM in managing OA pain.

Methods: A search strategy using PubMed and Embase through August 19, 2020, was completed. Titles, abstracts, and full texts were screened independently by two reviewers using Covidence® with conflicts resolved by a third reviewer. Experimental, observational, or case studies written in English, single-agent, and combination MSM formulations were

included. Endpoints were symptomatic improvement of musculoskeletal pain associated with OA using pain scales, dosage, and SE profiles of MSM.

Results: 14 studies with 899 participants were included, where 423 received MSM and 476 received either placebo or glucosamine-chondroitin combination. 11 studies assessed knee OA, 2 for general OA, and 1 for hand OA with results pending. 8 of 11 studies for knee OA showed symptom improvement with doses ranging 500 mg to 6,000 mg and durations ranging 60 days to 16 weeks. Both studies for general OA showed symptom improvement with doses ranging from 1,000 mg to 4,000 mg and durations ranging 12 weeks to 19 months. 7 trials used oral formulations, 1 used a topical formulation, and 6 trials used combination formulations. 3 trials reported minor SE, including gastrointestinal symptoms and respiratory symptoms.

Conclusions: Findings suggest oral MSM over 60 days to 16 weeks showed improvement in knee OA and general OA using pain scales. It was well tolerated, with minor SE reported in 3 trials. MSM combination formulations with glucosamine and chondroitin yielded better results. Further studies of head-to-head trials with standard treatment are recommended to determine the full potential of MSM.

Impact of Statin Intensity on the Incidence of Vascular Events and Graft Survival in Heart Transplant Recipients

Stella Kim, PharmD Candidate; Ian Booth, PharmD; Bharath Ravichandran, PharmD; Moses Demehin, PharmD; Ronson Madathil, MD; Michael Plazak, PharmD

Purpose: Cardiac allograft vasculopathy (CAV) limits long-term graft survival of heart transplant (HT) recipients. In addition to decreased synthesis of cholesterol, statins also demonstrate immunomodulatory effects and slow progression of CAV. Few studies have assessed the effects of statin potency on long-term graft outcomes.

Methods: This single-center, retrospective, cohort study included HT recipients from 2012-2020 who were started on high-intensity statins and compared them to those started on moderate/low-intensity statins within the first six months of HT. The primary endpoint was freedom from a composite of International Society of Heart and Lung Transplantation (ISHLT) CAV1-3, need for percutaneous coronary intervention (PCI), graft loss, or death. Secondary endpoints included each component of the composite endpoint. Cox proportional hazards models were used for primary and secondary outcomes, and event curves were generated using the Kaplan-Meier method. Metabolic parameters were assessed using repeated measures ANOVA.

Results: Of 142 patients included, 47 received high-intensity and 95 received low/moderate intensity statins within six months of HT. Mean follow-up was longer in the low/moderate intensity cohort (4.4 ± 2.2 vs. 3.1 ± 1.9 years; p=0.0008). Baseline characteristics were similar between groups, aside from induction therapy and baseline triglycerides (Table 1). Aspirin use was common (97.9% high intensity vs. 96.8% low/moderate intensity; p=0.99); sirolimus conversion was similar between groups (38.3% high intensity vs. 34.7% low/moderate intensity; p=0.82). There was no significant difference in the primary composite outcome (HR, 1.34; 95% CI, 0.80-2.22; p=0.26), even after controlling for induction therapy and pre-transplant hyperlipidemia (Figure 1). There were no significant differences in any of the secondary outcomes. After 12 months of follow-up, low-density lipoprotein marginally increased in the low/moderate intensity cohort (0.87 ± 43.3 mg/dL high intensity vs. 12.6 ± 32.1 mg/dL low/moderate intensity; p=0.22).

Conclusions: This study suggests that early initiation of high intensity statins provides no benefit in the prevention of long-term adverse vascular and graft outcomes compared to low/moderate intensity statins. Given their increased propensity for adverse effects (e.g., myalgias), high intensity statins may better serve HT recipients with refractory post-HT hyperlipidemia.

Table 1. Baseline Characteristics	**High Intensity (n=47)**	**Low/Moderate Intensity (n=95)**	**p-value**
Age, median (IQR)	57 (50.5-64.5)	59.3 (50.3-65.1)	0.34
White, n (%)	25 (53.2)	45 (47.4)	0.80
Male, n (%)	33 (70.2)	68 (71.6)	0.99
Ischemic cardiomyopathy, n (%)	15 (31.9)	33 (34.7)	0.88
Left-ventricular assist device, n (%)	23 (48.9)	54 (56.8)	0.48
Cold ischemic time (minutes), median (IQR)	162 (125.5-216.5)	148 (121-188.5)	0.11
Comorbidities, n (%)			
Hypertension	31 (66)	65 (68.4)	0.92
Hyperlipidemia	24 (53.3)	45 (47.4)	0.72
Diabetes	23 (48.9)	39 (41.1)	0.48
CVA/TIA	6 (12.8)	14 (14.7)	0.99
PVD	2 (4.3)	7 (7.4)	0.72
Induction, n (%)			
Steroids	19 (40.4)	48 (50.5)	
Alemtuzumab	9 (19.1)	24 (25.3)	
Anti-thymocyte globulin	17 (36.2)	13 (13.7)	0.04
Desensitization	2 (4.3)	9 (9.5)	
Basiliximab	0 (0)	1 (1.1)	
CMV high-risk mismatch, n (%)	9 (19.1)	19 (20)	0.99
cPRA (%), median (IQR)	30 (0-65)	33 (2-62)	0.72
Changes over 12 months, mean ± SD			
Triglycerides (mg/dL)	18.8 ± 74.7	-5.7 ± 87.9	0.10
HDL (mg/dL)	6 ± 19.9	7.4 ± 20.1	0.84
LDL (mg/dL)	0.87 ± 43.3	12.6 ± 32.1	0.22
Hemoglobin A1c (%)	0.17 ± 1	0.17 ± 1.9	0.84

Pharmascript
Volume 45, Issue No. 1
Supplement 1
First Quarter

Figure 1.