Medication Access & Adherence

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The determinants of adherence and nonadherence span a broad ecologic spectrum. Medication adherence has different domains of influence at the individual (biologics and efficacy of drugs, psychosocial factors such as health literacy, self-efficacy), and societal levels (health care insurance coverage and out of pocket costs, access to transportation etc.). The presentations during this session centered on the stated domains of influence above.

Question posed for discussion: Given this varying range of adherence determinants, as researchers, do we focus on a range of interventions to address these influencing factors, or rather, have multifaceted interventions that addresses all the levels of influence on adherence?

Audience remarks: Members of the audience stated the need for more tailored interventions for patients. All patients do not need to receive the same type of intervention. There is however difficulty with developing interventions when every patients' reason for adherence is different. Other comments discussed the need to use the explanatory model to understand patients' perception of their illness and why they may not take their medicines. Also, understanding the medication use experience of patients is critical and pharmacists need to pay attention to each individuals' experience. There was discussion on the need to incentivize patients to adhere and if this was common or another way to deal with adherence. Overall, as researchers, scientists, and pharmacists, we should understand that medication adherence is a complex problem we have studied for decades with no final solution. However, we have made lots of progress in understanding the problem and developing interventions, but now, our future work demands a focus on tailored interventions that specifically meet patients' needs.

The Association Between Adverse Drug Reaction Incidence and Drug Adherence – A Systematic Approach

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ABSTRACT

Introduction: Medicaid patients are in poorer health, suffer a higher incidence of comorbidities and polypharmacy compared to the general population and may be at increased risk of Adverse Drug Reactions (ADRs). Using a previously collected database of Medicaid patients, this study will examine the association between estimated ADR incidence and drug adherence. The ADverse Drug Reaction/Event Screening System (ADDRESS) dataset provides incidence estimates top ADRs for each drug, which when combined provide a probabilistic incidence of ADRs (the drug's ADR "misery index"). Combining the ADR misery indexes for each drug on the patient's regimen provides the patient's overall ADR misery index. It will then be possible to explore associations between adherence and individual ADR incidence, total drug ADR incidence, and drug regimen ADR incidence.

Proposed Method: The ADDRESS database lists the incidence rates of all observed ADR symptom clusters for each drug, by synthesizing data on ADR incidence from the literature. For each patient, a list of all drugs taken will be extracted from the Medicaid dataset, and the Drug ADR misery for all of the patients' medications combined to derive total ADR misery, the probable ADR incidence for the patient' entire drug regimen.

The study will test if an association exists between individual drug adherence and drug ADR misery index, between total drug regimen ADR misery index and regimen adherence, if the strength of association between adherence and ADR misery will differ across drug indications, and if the association between adherence and ADR misery differs across different disease states.

Adherence to Biologic and Conventional Disease Modifying Anti-Rheumatic Drugs in Patients with Rheumatoid Arthritis

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ABSTRACT

Objectives: Though biologic disease modifying anti-rheumatic drugs (bDMARDs) have shown higher efficacy and better tolerance in clinical trials than conventional disease modifying anti-rheumatic drugs (cDMARDs), their cost could potentially affect patient adherence. The objective of this study was to estimate adherence to bDMARDs and cDMARDs in patients with Rheumatoid Arthritis (RA), and to assess if adherence is associated with drug class (bDMARDs vs cDMARDs) or patient out-of-pocket (OOP) costs.

Methods: Patients with RA from the 2008-2012 Medicare Current Beneficiary Survey (MCBS) data with at least 2 Medicare Part D claims were included. Medication adherence was calculated as proportion of days covered (PDC) in a six-month period following date of first medication fill. Individuals with PDCs>=0.80 were considered adherent. Total OOP medication costs per patient were generated as a sum of imputed OOP costs per claim. Logistic regression was used to assess associations between adherence and class of drug and OOP costs.

Results: 542 patients met inclusion criteria. 85% were on cDMARDs. The proportion (95% confidence interval) of patients adherent to bDMARDs, 0.48, (0.40, 0.56), did not differ significantly from that for cDMARDs, 0.52, (0.47. 0.56) (p=0.1293). Patients on bDMARDs had significantly higher mean OOP costs ($922.86±1720) than patients on cDMARDs ($40.26±51.93). In univariate logistic regressions, there was no significant association between DMARD type (p=0.13) and adherence, or OOP costs (p=0.72) and adherence. In a multivariate logistic model, there was a trend towards bDMARDs having lower adherence (O.R.=0.6, 95% C.I. (0.351, 1.032)) than cDMARDs, but the difference was not significant (p=0.06).

Conclusion: Adherence to DMARD therapy in patients with RA was relatively low at approximately one-half, and did not differ significantly between patients on biologic DMARDs (0.48±0.08) and those on conventional DMARDs (0.52±0.04), although patients on bDMARDs paid more out-of-pocket on an average as compared to patients on cDMARDs.

Cost-Effectiveness of a Theoretical Pharmacist-Led Breast Cancer Adherence Intervention

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ABSTRACT

Introduction: Among women with estrogen receptor positive (ER+) breast cancer, adjuvant treatment with tamoxifen significantly reduces the risk of recurrence and breast cancer mortality during and after treatment. However, poor adherence and persistence to therapy adversely impact patient outcomes. An understanding of how costs and effect size affect the cost-effectiveness of adherence interventions is needed for improved development of such interventions.

Objective: To evaluate benefits needed for a hypothetical pharmacist-led adherence intervention to be considered cost-effective at a threshold of $100,000 per quality-adjusted life years (QALY) gained for patients with prior breast cancer on tamoxifen adjuvant therapy as compared to usual care from an insurer's perspective.

Methods: A five-state Markov model was developed to evaluate the adherence intervention compared to no intervention. Annual cycles and a five-year time horizon were used. A systematic review of the literature was conducted to identify the risk of breast cancer recurrence at varying levels of adherence and persistence. Clinical model inputs, costs, and utilities were similarly identified. Tamoxifen cost was based on wholesale acquisition cost; effectiveness was measured in terms of QALY gained. Relative improvement in adherence or persistence was varied and the associated program cost was estimated for assessing incremental cost-effectiveness at a willingness-to-pay (WTP) threshold of $100,000/QALY.

Results: In the first year, 75% of patients remained persistent, 93% of which were adherent. An annual program cost of $198 would need to result in a 7% relative (6.5% absolute) improvement in adherence to be cost-effective. An annual program cost of $155 would need to result in a 10% relative (7.5% absolute) improvement in persistence to be cost-effective.

Conclusion: Programs need to cost $\leq$$200 per year to be considered cost-effective if producing small gains in adherence, if impacting adherence or persistence separately. Programs with higher cost must demonstrate significant gains in either adherence or persistence, or impact both measures.

Key Words: Breast Cancer, Cancer, Medication Adherence, Recurrence, Tamoxifen, Adjuvant

Antidiabetic Drug Adherence among Childless Adults Experiencing Medicaid Coverage Expansion in Wisconsin

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ABSTRACT

Introduction: On April 1st, 2014, Medicaid coverage for childless adults in Wisconsin was expanded through an amended section 1115 demonstration waiver. In the new waiver, prescription drug benefit was expanded via copayment reductions and a drug formulary expansion.

Objective: To identify the effects of expanded drug coverage on medication adherence for oral antidiabetic drugs in childless adults having type II diabetes.

Methods: A pre-test, post-test study with a non-equivalent control group was conducted using Wisconsin Medicaid administrative enrollment records, medical and drug claims data. The study period was from April 2013 to March 2015 to include one full year before and after the effective date of the coverage expansion. Medication adherence was measured using proportion of days covered (PDC). PDC for at least one drug from the four most commonly used oral antidiabetic drug classes was calculated, and then the percentage of patients who met the threshold of PDC ≥ 0.8 was identified. Difference-in-difference analysis was performed to compare changes in the adherent percentage among the childless adults with parents/caretakers.

Results: The study population included 1,158 childless adults and 4,128 parents/caretakers. In the pre-period, the percentage of adherent patients (PDC ≥ 0.8) for at least one drug from the four classes was 74% in the childless adults and 60% in the parents/caretakers. A fully adjusted difference-in-difference OLS regression showed it significantly increased by 6% points (p = 0.01) in the childless adults compared to the parents/caretakers.

Conclusion: Medication adherence for oral antidiabetic drugs was slightly but significantly improved in the low-income childless adults after the drug coverage expansion.

Implications: Drug insurance affects medication adherence as it can directly determine the accessibility and affordability of the drugs. Policymakers need to design drug insurance coverage to ensure appropriate treatment of chronic conditions for low-income childless adults.

Key Words: Medicaid, Drug insurance coverage, Medication adherence, Diabetes, Childless adults

Exploring the Barriers and Facilitators of Medication Adherence in Patients with Type 2 Diabetes across Different Health Literacy Levels

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ABSTRACT

Introduction: Non-adherence continues to be a barrier to achieving optimum health outcomes in patients with type 2 diabetes. Prior research shows that health literacy has an indirect impact on diabetes medication adherence via several contributing factors. Though these existing studies identified several barriers and facilitators to medication adherence, limited research empirically investigates these barriers and facilitators across different levels of patients' health literacy. Understanding the factors that facilitate or hinder patients' diabetes medication adherence across different health literacy levels may lead to the development of health literacy tailored adherence interventions to improve diabetes care.

Objective: This study aims to examine whether the contributing factors to medication nonadherence among patients with type 2 diabetes differ across health literacy levels. Also, we will compare the similarities and differences in contributing factors to medication nonadherence across participants from different health literacy levels.

Theoretical framework: The Health Literacy Pathway Model will identify the interpersonal and intrapersonal factors that could contribute to medication adherence. These include interpersonal factors such as self-efficacy for medication use, perceived barriers related to medication nonadherence, belief about medicines, and intrapersonal factors such as provider-patient communication.

Proposed methods: This cross-sectional study will be conducted using a convergent mixed methods design. Participants with a diagnosis of type 2 diabetes, who are at least 20 years, understand English, and have been prescribed at least one diabetes medicine will be included. A face-to-face survey will be administered to 300 participants to investigate differences in factors contributing to medication adherence across health literacy levels. Subsamples of 6 participants will be purposively selected from each health literacy level (i.e. adequate and inadequate) and two medication adherence levels (i.e. low and high), assessed by the Newest Vital Sign and the Adherence to Refills and Medications Scale, respectively. A 60-minute face-to-face semi-structured interview will further explore factors contributing to medication adherence across health literacy levels. By merging the results from the survey and interview, we will understand the barriers and facilitators of medication adherence in patients with different levels of health literacy and medication adherence.

Key Words: barriers, diabetes, facilitators, health literacy, medication adherence

Closing the Medicare Part D Coverage Gap: Impact on Out-Of-Pocket Burden, Drug Utilization, and Access to Care among Beneficiaries and Those with Cancer

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ABSTRACT

Introduction: The standard Medicare Part D benefit contains a gap in coverage (or so-called "doughnut hole") which requires beneficiaries to pay 100% of the cost for prescription drugs until they reach the catastrophic coverage phase. This coverage gap has been linked to financial burden for beneficiaries resulting in poor medication adherence. Under the Affordable Care of Act (ACA), the coverage gap has been phasing out gradually since 2011, which will be completed filled by 2020 such that beneficiaries will only pay 25% of drug costs.

Objective: This study aims to estimate the impact of closing the coverage gap under the ACA on out-of-pocket (OOP) burden and access to prescription drugs for Part D beneficiaries, particularly in those with cancer. In order to achieve these goals, this study have three objectives: (1) to examine the changes in drug utilization and OOP costs for all Part D beneficiaries, (2) to examine the changes in drug utilization and OOP costs for Part D beneficiaries with cancer, and (3) to estimate the impact of the closing the gap on access to drugs.

Theoretical Framework: Based on the Andersen's Behavioral Model of Health Services Use, a conceptual model is developed and the detailed variables will be identified. This model proposes the individual characteristics influencing health behaviors such as drug use and expenditures, which, in turn, affect associated outcomes such as out-of-pocket burden or access to drugs.

Proposed Methods: Data will be obtained from 2008 through 2015 Medicare Current Beneficiary Survey data. The sample will include non-disabled Part D beneficiaries with and without low-income subsidies, which will be a comparison and treatment group, respectively. A difference-in-differences approach will be employed to measure the changes in outcome of interests among both the treatment and the comparison group for all beneficiaries and those with cancer after the ACA.

Key Words: Medicare Part D, Coverage Gap, Drug utilization, Out-of-pocket Burden, Access to Care

Relationship of Travel Distance and Time to Dispensing Pharmacies on Warfarin Control in an Urban Population

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ABSTRACT

Introduction: Oral anticoagulation therapies, such as warfarin, require frequent clinic visits for close monitoring and dose adjustments to ensure optimal control within a narrow therapeutic range. Poor health outcomes have been identified in individuals with longer travel time and distance to clinics.[1] Individuals with transportation barriers have also been reported to have reduced access to medications and pharmacies. Transportation is one of several socio-environmental factors identified to indirectly impact adherence to chronic therapies.[2] While transportation barriers, such as travel distance and time, have been shown to negatively impact health outcomes, such data are lacking in patients on chronic anticoagulation who necessitate frequent access to care. **Objective:** To explore whether a relationship exists between patient's travel distance and time to dispensing pharmacies and the quality of anticoagulation control in an urban population of patients on warfarin therapy. **Theoretical Framework:** Existing literature on transportation to healthcare access, the Social Determinants of Health, and the World Health Organization (WHO) dimensions of adherence will be used to develop a conceptual model that identifies factors of transportation that impacts health outcomes. **Proposed Methods:** Patients older than 21 years old and treated with warfarin will be recruited from an outpatient Antithrombosis Clinic (ATC) for an interview administered questionnaire as part of a larger study. Patients' residential address and pharmacy locations will be geocoded using ESRI's ArcGIS Online Geocode Service (ESRI, Redlands, CA) as longitude and latitude coordinates.[3] Euclidean or straight-line distance will be used to calculate the travel distance between the patient and pharmacies. Anticoagulation control will be assessed by percent time in therapeutic range (%TTR) over 6 months using the Rosendaal's method.[4] The multivariate regression model will include pertinent socio-demographic factors, adherence, number of dispensing pharmacies, approximate travel time to pharmacy, travel barriers to pharmacy, availability of transportation, mode of transportation, and other relevant clinical factors that impact anticoagulation control.

Key Words: Anticoagulation, Warfarin, Transportation, Distance, Dispending Pharmacy, Health Service Accessibility, Adherence

References

1. Syed ST, Gerber BS, Sharp LK. Traveling towards disease: transportation barriers to health care access. J Community Health. 2013;38(5):976-93.
2. Sabaté, E. Adherence to long-term therapies - Evidence for action. Geneva, Switzerland. World Health Organization. 2003.
3. ArcGIS Online Geocoding Service. ESRI. 2014
4. Rosendaal FR, Cannegieter SC, Van der meer FJ, Briët E. A method to determine the optimal intensity of oral anticoagulant therapy. Thromb Haemost. 1993;69(3):236-9.