

Abstract Session B5: Quality of Care

Blood Pressure among Older U.S. Adults with Diabetes Differs by Social Support and Income Laura Plantinga¹; Urmimala Sarkar¹; Dean Schillinger¹. ¹Center for Vulnerable Populations, San Francisco General Hospital, and University of California, San Francisco, California. (Proposal ID # 10590)

BACKGROUND: Persons with diabetes commonly have hypertension, which substantially increases the risk of macro- and microvascular disease. Social support has been shown to be associated with improved blood pressure control. Having emotional support might allow greater adherence to medications and dietary and activity recommendations and decrease overall stress, leading to greater blood pressure control. However, a person's financial resources could modify any such effect. Whether the association of social support with blood pressure control differs by income among older persons with diabetes mellitus has not been explored.

METHODS: We used the National Health and Nutrition Examination Survey (NHANES) 1999-2008 to examine associations of social support with blood pressure control among 1,681 U.S. adults (≥ 60 years old) with self-reported diabetes and information on social support. Standardized questionnaires assessed, over the previous 12 months, whether the respondent had emotional support ["Can you count on anyone to provide you with emotional support such as talking over problems or helping you make a difficult decision?" (yes/no)] and total number of respondent's close friends. Blood pressure was measured (up to four measurements) by standardized protocol and the average mean arterial pressure (MAP) was calculated for each participant. Multivariable logistic regression with U.S. population-based weighting was used to obtain adjusted estimates.

RESULTS: Overall, 92.4% reported having someone who provided emotional support and the mean number of close friends was 7.7. After adjustment for age, gender, race/ethnicity, time since diabetes diagnosis, and last visit to a doctor (≤ 1 vs. > 1 year), reported emotional support was associated with higher MAP in those with lower income and with lower MAP in those with higher income (see below). A similar pattern was seen for social network, with a greater reported number of close friends being associated with lower MAP among those with higher income. The effect modifications observed for blood pressure and emotional support by income were strongest in persons with diabetes who were male, white, and/or reported no outside financial support.

CONCLUSION: Older persons with diabetes in the United States have relatively high levels of social support overall. Having a larger and more supportive network appeared to be beneficial for blood pressure control among those with higher income. The observed association of worse blood pressure control among lower-income individuals with greater emotional support, particularly among those without outside financial support, suggests that the emotional support received by those with fewer resources may increase stress (*e.g.*, inability to act upon health advice due to lack of access) and/or may lead to health behaviors that worsen hypertension (*e.g.*, poor dietary choices in social situations). Those with fewer resources may require greater, more material support to control their blood pressure. Further study of the mechanisms by which social support influences blood pressure control among poor elders with diabetes is needed.

Adiponectin and All-Cause Mortality in a Cohort of Elderly People with Type 2 Diabetes Jessica Rohman Singer¹; Walter Palmas¹; Steven Shea¹; Jose Alejandro Luchsinger¹. ¹Division of General Medicine, Department of Medicine, Columbia University College of Physicians and Surgeons, New York, New York . (Proposal ID # 7871)

BACKGROUND: Nearly a quarter of Americans over the age of 60 are estimated to have type 2 diabetes. The Action to Control Cardiovascular Risk in Diabetes Trial demonstrated that tight glycaemic control was associated with increased mortality, while tight lipid and blood pressure control had no association with mortality. These surprising findings raise the possibility of novel predictors of mortality in people with type 2 diabetes. We sought to explore whether insulin resistance measured by adiponectin level was related to increased mortality in people with type 2 diabetes. High levels of adiponectin are known to be associated with lower risk of developing type 2 diabetes, but no data have been published to our knowledge regarding the association of adiponectin level and mortality specifically in patients with type 2 diabetes. Data regarding adiponectin level and mortality in non-diabetic populations are inconsistent.

METHODS: Participants were a subsample of 627 subjects from the Informatics for Diabetes Education and Telemedicine project (IDEATel) who were enrolled in a substudy. IDEATel was a CMS supported randomized controlled trial designed to evaluate the effectiveness of telemedicine case management in elderly Medicare beneficiaries with type 2 diabetes but without severe co-morbid disease. Subjects were enrolled in IDEATel from December 2000 to October 2005. Adiponectin was measured on frozen serum samples for all subjects and mortality data were collected from the National Death Index through 11/30/2009. ANOVA and Chi-square were used to compare relevant continuous and categorical variables across quartiles of adiponectin. Cox proportional hazards regression was performed to examine the relationship between adiponectin level and all-cause mortality adjusting for age, gender, race/ethnicity, hemoglobin A1c, blood pressure, LDL, HDL, triglycerides, BMI, albumin/creatinine ratio, c-reactive protein, active tobacco use and medication usage, specifically thiazolidinediones (TZDs).

RESULTS: Subjects had a mean age of 72, were 70% women, 83% Hispanic and 15% African American. Compared to the lowest adiponectin quartile, those in the highest adiponectin quartile had higher HDL (51.4 +/- 16.7 vs. 42.7 +/- 12.3; $p < 0.001$), higher log albumin/creatinine (1.6 +/- 0.6 vs 1.3 +/- 0.5; $p = 0.0037$), higher frequency of TZD use (58.6% vs. 5.8%; $p < 0.0001$), lower triglycerides (121.6 +/- 61.3 vs 144.6 +/- 77.9; $p = 0.005$) and lower CRP (0.3 +/- 1.3 vs. 1.0 +/- 1.3; $p < 0.0001$). Cox regression models demonstrated that compared with those in the lowest quartile of adiponectin, those in the highest adiponectin quartile had an increased hazard of death with a fully adjusted hazard ratio of 4.0 (95% CI 1.7, 9.2); p -value=0.0003 for trend across quartiles of adiponectin level (Table 1). These results remained consistent when the analysis was stratified by age, gender and TZD usage and after excluding those subjects who died within one year of adiponectin sampling. We conducted a secondary analysis in a sample of 464 participants for whom we were able to calculate change in weight predating the adiponectin measurement. After adjustment for weight gain or loss of more than 10% of body weight, the association between adiponectin and higher mortality remained significant with a fully adjusted hazard ratio of 3.1 (95% CI 1.2, 7.9); $p = 0.01$ for trend across quartiles of adiponectin level.

CONCLUSION: Higher adiponectin level was associated with higher all-cause mortality in a cohort of elderly people with type 2 diabetes.

A Telephone-based Lifestyle Intervention to Lower Risk Factors in Ethnic Minority and Lower Socioeconomic Status Adults at Risk of Diabetes Alka M. Kanaya¹; Jasmine Santoyo-Olsson²; Steven Gregorich²; Melanie Grossman²; Tanya Moore³; Anita Stewart².¹University of California, San Francisco, San Francisco, California; ²UCSF, San Francisco, California; ³Berkeley Dept of Public Health, Berkeley, California. (Proposal ID # 10230)

BACKGROUND: Intensive lifestyle interventions are effective in lowering diabetes incidence in randomized clinical trials, but few community translations exist using less intensive interventions. We determined the effect of a translational lifestyle program (Live Well, Be Well) designed to reduce diabetes risk factors in lower-socioeconomic status ethnic minority groups.

METHODS: We conducted a randomized controlled trial with a wait-list control group in a Northern California community. Individuals age ≥ 25 years at risk for diabetes by self-report risk assessment and elevated fasting fingerstick glucose were eligible. The intervention group received individualized lifestyle counseling. Public health department staff provided education and skills training via 2 in-person sessions, followed by goal-focused telephone counseling. Primary outcomes included fasting glucose, triglycerides, HDL-, LDL-cholesterol, weight, waist circumference, and systolic blood pressure at 6 and 12 months. Secondary outcomes included diet, physical activity, and health-related quality of life.

RESULTS: Of 230 participants randomized, 113 (49%) were assigned to the lifestyle intervention. Significant group differences in 6-month change scores were observed for weight and triglycerides. The intervention group lost approximately 2 pounds more than the control group ($P=.03$) and had greater reductions in triglycerides (difference 23 mg/dL, $P=.02$). The intervention group consumed approximately 7.1 fewer grams of fat per day ($P=.04$) and consumed more fruits and vegetables ($P=.01$) than the control group. Overall study retention was 92%.

CONCLUSION: Despite challenges designing effective community-based translations for lower SES communities, this individually-tailored, low intensity lifestyle program was associated with improvements in some diabetes risk factors. LWBW provides a promising model for reducing disparities in diabetes risk and an alternative to group-based community translations.

The effect of clinical complexity on the receipt of comprehensive care for diabetes LeChauncy D Woodard¹; Cassie R Landrum²; Degang Wang³; Tracy Urech²; Salim S Virani³; Laura A Petersen³. ¹Michael E. DeBakey VA Medical Center, Houston, Texas ; ²Michael E. DeBakey VA Medical Center HSR&D Center of Excellence, Houston, Texas ; ³Michael E. DeBakey VA Medical Center HSR&D Center of Excellence & Baylor College of Medicine, Houston, Texas . (Proposal ID # 10990)

BACKGROUND: Approximately 80% of patients with diabetes have at least 1 chronic comorbid illness, and 40% have 3 or more. The importance of comprehensive diabetes care, including blood pressure, lipid, and glycemic control, is widely acknowledged for most diabetic patients. Achieving guideline-recommended treatment goals may have the greatest benefit in preventing diabetes-related complications among the most complex patients, so assessing the magnitude of deficits in care for these patients is important. To examine the relationship between clinical complexity and guideline-recommended care for patients with diabetes, we assessed the impact of comorbidity type, illness burden, and number of comorbidities on achievement of glycemic, blood pressure, and lipid control.

METHODS: We identified 35,872 patients with diabetes receiving primary care between July 2007 and June 2008 at 7 Veterans Affairs facilities in 3 states. We assessed quality according to American Diabetes Association guidelines for blood pressure (<130/80 mm Hg), glycemic (hemoglobin A1c <7%), and lipid (low-density lipoprotein <100 mg/dL) control. We defined overall good quality of care as the sum of patients meeting a guideline at the time of an index primary care visit and those receiving appropriate care (e.g., appropriate medication added to regimen or follow-up reading controlled) during a 45-day follow-up. We performed 3 separate ordered logistic regression analyses to examine the impact of different measures of clinical complexity on receipt of overall good quality for at least 1, at least 2, or all 3 of the diabetes quality measures. We defined clinical complexity by: 1) condition type (diabetes- concordant [related], discordant [unrelated], both, or neither), 2) illness burden (measured by Diagnostic Cost Group Relative Risk Scores), and 3) number of chronic comorbidities. All analyses were adjusted for age and clustering at the facility level.

RESULTS: 718 (2.0%) of patients received overall good quality for 0 of the 3 measures, 3,396 (9.5%) received overall good quality for only 1 of the 3 measures, 11,262 (31.4%) received overall good quality for only 2 of the 3 measures, and 20,496 (57.1%) received overall good quality for all 3 of the measures. When measuring complexity using condition type, patients with both diabetes-concordant and discordant comorbid conditions were more likely than those with no comorbidities to receive overall good quality for all 3 measures (odds ratio [OR], 2.46; 95% confidence interval [CI], 2.24-2.71). In addition, patients with the highest illness burden were more likely than those with the lowest illness burden to receive overall good quality for all 3 quality measures (OR 1.62, 95% CI 1.53-1.71). Further, patients with the highest number of comorbid conditions were more likely than those with no comorbid conditions to receive overall good quality for all 3 quality measures (OR 2.76, 95% CI 2.51-3.04).

CONCLUSION: We found that over half of diabetic patients received overall good quality for all 3 measures of diabetes care. Patients with the greatest levels of clinical complexity received higher levels of comprehensive care for diabetes compared to less complex patients, regardless of the definition of complexity chosen. While providers may be appropriately targeting the most complex patients for aggressive diabetes management, aiming to improve goal attainment in less complex patients may be an important area for quality improvement.

Comparative Effectiveness of Different Point-of-Care Strategies to Improve Antibiotic Use for Acute Bronchitis in Primary Care Ralph Gonzales¹; Ralph Gonzales¹; Tammy Anderer²; Melissa Stahl³; Michelle Yefko³; Judith Maselli¹; Julie Molecavage³; Fred Bloom³; Joshua Metlay³. ¹UCSF, San Francisco, California ; ²Geisinger Health System, Danville, Pennsylvania ; ³University of Pennsylvania, Philadelphia, Pennsylvania . (Proposal ID # 11243)

BACKGROUND: The National Committee on Quality Assurance now includes the level of antibiotic prescribing for uncomplicated acute bronchitis (AB) as a HEDIS measure. We have previously shown that providing emergency physicians with an acute cough algorithm based on vital signs and chest examination at the point-of-care was effective at reducing antibiotic prescribing for uncomplicated AB. To evaluate this approach in primary care practices, we partnered with an integrated healthcare system to evaluate two approaches for implementing this algorithm at the point-of-care—an examination room poster vs. an electronic health record (EHR) standardized intake form and linked order set.

METHODS: In October 2009, we conducted a three-arm, cluster randomized trial across 37 primary care practices. The EHR-based intervention arm (Epic Care) included a management algorithm as a best practice alert linked to a document flow and integrated set of electronic orders. The Poster-based intervention arm included the same management algorithm as an 11x17 inch laminated poster that was displayed in all examination rooms. Implementation of the algorithms at both types of intervention sites were led by local physician champions. The primary outcome was the proportion of AB visits prescribed an antibiotic within 48 hours of the visit. AB visits were excluded if patients had COPD, immunosuppression or other types of organ failure/deficiency, or if an antibiotic-responsive secondary diagnosis (such as acute sinusitis, pharyngitis, otitis media or pneumonia) was recorded for the AB visit. Antibiotic prescription rates for each group in the intervention period (October 2009 – March 2010) were compared with similar periods during the prior three years using multi-level adjusted regression models to account for practice and clinician-level clustering.

RESULTS: Primary care practices were predominantly family practice (10 of 14 in Control group, 10 of 11 in Poster group and 11 of 12 in EHR group). Baseline patient and physician demographic characteristics did not vary between study groups. Mean and median patient age was 44 years, 60% of visits were by women. Abnormal vital signs were uncommonly present (3% to 8% of visits had elevated temperature, respiratory rate or heart rate). Chest radiography was utilized at the same rate between study groups (5% for all groups). Baseline antibiotic prescription rates for AB during 3 preceding study periods among Control (n=3433 visits; 71.8%), Poster (n=4020 visits; 79.5%) and EHR sites (n=3247 visits; 74.8%) varied significantly (P<0.001). The changes in antibiotic prescription rates during the intervention period at the Poster sites (n=919; -10.6%; P-value=0.03) and the EHR sites (n=934; -14.7%; P-value=0.05) were significantly different than the change at the control sites (n=815; +0.4%). There was no difference between the change in antibiotic prescribing at Poster and EHR sites (P=0.87). The Poster development cost about \$1500 and the EHR tool development cost about \$18,500.

CONCLUSION: We conclude that an evidence-based algorithm to guide management of AB can reduce overuse of antibiotics in primary care settings, but the mode of implementation does not appear to impact the magnitude of effect. Studies of electronic decision support tools that do not compare with more traditional implementation strategies may significantly overestimate the value of electronic decision support.

Regional Variation in Transplant Waitlist: A Contributor to Transplant Disparities Milda R Saunders¹; Hyo Jung Tak¹; Lainie Friedman Ross¹; G. Caleb Alexander¹. ¹University of Chicago Medical Center, Chicago, Illinois . (Proposal ID # 11371)

BACKGROUND: There is substantial regional variation in healthcare quality in the United States. African Americans and Whites are not distributed equally among regions in the US. The objectives of this study were to quantify regional differences in access to the renal transplant waitlist, and to examine how these differences may contribute to racial disparities in waitlist access.

METHODS: Using the United States Renal Data System (USRDS), we examined non-Hispanic Whites (n=166,874) and Blacks (n=133,474) aged 18-70 who initiated dialysis between January 2000 and December 2006. We linked U.S. 2000 Census Data to USRDS data using subjects' zip code at dialysis initiation. We defined our outcome variable as time to transplant waitlist after dialysis initiation. We used the 11 United Network for Organ Sharing (UNOS) regions as indicator variables in order to account for geographic and administrative boundaries. First, we used Cox proportional hazards to identify the association between UNOS region and time to transplant waitlist while adjusting for individual (age, gender, insurance and employment status, BMI, and co-morbidities at dialysis initiation) and neighborhood (proportion female headed households, male unemployment, percent poverty and proportion without high school diploma) characteristics. UNOS Region 3 was used as the reference group because it was largest and had longest time to transplant waitlist. Then we used Cox proportional hazards to compare time to transplant waitlist for Whites and African Americans within a given region after adjusting for the individual and neighborhood characteristics above.

RESULTS: The average time to renal transplant waitlisting was 23.7 months and was significantly shorter for Whites (22.1 months) than African Americans (25.8 months, $p < 0.001$). Women, those with coronary artery disease, greater neighborhood disadvantage, Medicaid or no insurance at dialysis initiation had a longer average time to waitlisting than their counterparts (all p -values < 0.05). Compared to patients in Region 3 (see Table 1), patients in eight of the ten other regions were more likely to appear on transplant waitlist (adjusted HR 1.1-1.6, p -values < 0.05). Compared to Whites within the same region, African Americans had similar times to transplant waitlist in all but three regions. African Americans had a longer time to transplant waitlist than their White counterparts in regions 3 and 4, but waited less time in region 5. Over 30% of the African American population with end stage renal disease resided in Regions 3 and 4 which have both longer times to transplant waitlist overall and disparities between African Americans and Whites.

CONCLUSION: African Americans are over-represented in geographic regions with longer times to renal transplant waitlist. Within these regions they face "double disadvantage" due to racial disparities in time to transplant waitlist. These regional differences may play an important role in transplant waitlist disparities.