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Psychological insulin resistance among low-income, U.S. racial minority patients with type 2 diabetes

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ABSTRACT

Aims: To examine psychological insulin resistance (PIR), the unwillingness to accept insulin therapy, within a unique U.S. population of patients with diabetes.

Methods: A cross-sectional survey of PIR among low-income, U.S. Latino and African-American (AA) patients with type 2 diabetes recruited from a diabetes specialty clinic.

Results: Data from 136 insulin-naïve respondents (57% female, 69% Latino, mean age 51.1 ± 10.3 years; $200–$1000 median monthly household income; grade 8–12 median education) revealed a 48% prevalence of complete unwillingness to begin insulin. In comparing Latinos to AA, Latino respondents were younger, lived fewer years in the U.S., had less education, were more likely unwilling to use insulin (53% vs. 30%, $p = 0.03$), and reported a more negative attitude to 8 of 9 PIR domains ($p \leq 0.01$ for each). Fewer years in the U.S. predicted greater unwillingness and a more negative attitude on 8 of 9 PIR domains ($p \leq 0.03$ for each); and less education predicted greater feelings of unfairness ($p = 0.01$).

Conclusions: PIR is highly prevalent among low income, U.S. Latino patients with type 2 diabetes. Our data may help to better guide culturally appropriate counseling regarding insulin use.

1. Introduction

"Psychological insulin resistance" (PIR) refers to a person's opposition toward the use of insulin. The phenomenon may apply to patients or providers, although usually the former, and has been reported to be highly prevalent across diverse populations of adult patients with diabetes [1–8]. The prevalence of complete unwillingness to use insulin among insulin-naïve individuals, even if medically necessary, has been estimated to be almost 40% in previously published surveys [6,7]. However, no previous studies have surveyed its prevalence specifically in a low-income, U.S. racial minority population, a demographic group that is disproportionately affected by diabetes [9,10]. To explore potential strategies to enhance insulin use in this demographic group, we surveyed the prevalence and characteristics of PIR among our inner city, minority patients with diabetes.

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2. Methods

The Diabetes Specialty Clinic at the Martin Luther King Jr. Multi-Service Ambulatory Care Center in South Los Angeles, CA, USA, serves a large inner city population of low-income, racial minority (almost exclusively Latino and African-American (AA) patients with diabetes. The survey for PIR was administered to consecutive adult patients with type 2 diabetes who had no known history of insulin use, and who were attending regularly scheduled clinic visits. We assessed the nature and extent of PIR using the Survey for People Who Do Not Take Insulin (SPI), the same survey used in previous reports [2,11]. Key components of this survey instrument include whether the respondent has ever used insulin; the respondent's willingness to use insulin ("*If your doctor recommended that you start insulin, how willing would you be to take it?*" as rated on a 4-point Likert scale ranging from "very willing" to "not willing at all"); and their agreement with 9 different domains of PIR (each stated as a negative attitude, and rated on a 6-point Likert scale ranging from "strongly agree" to "strongly disagree"). We also surveyed socio-demographic variables relevant to our population, including race, monthly family income, years living in the U.S., and highest educational level attained. Spanish versions of the survey were provided for anyone not sufficiently fluent in English, and all surveys were self-administered by the patient, unless the patient had severe literacy challenges, in which case the survey was read to the patient by the clinic provider or a family member, with the stipulation that all responses had to exclusively represent the patient's views. The study protocol was reviewed and exempted from informed consent requirements by the Institutional Review Board of Charles R. Drew University of Medicine and Science, as individual responses were collected from subjects anonymously.

Analyses were restricted to those respondents who additionally self-reported no previous exposure to insulin, defined as the absence of any previous temporary insulin use, including during hospitalizations or gestational diabetes. Incomplete responses to continuous variables were imputed using the group mean; incomplete responses to nominal or ordinal variables were not imputed. In addition to descriptive statistics, we compared Latino and AA respondents using Student's *t*-test or the Mann–Whitney test for continuous parametric and non-parametric variables, respectively; the χ^2 test for nominal variables; or the Mann–Whitney test for ordinal variables for which rank scores were arbitrarily assigned. Specific rank scores assigned to the various categories of each variable (monthly household income, number of years living in the U.S., highest level of education achieved, willingness to use insulin, and agreement with each PIR domain) are all shown in Table 1. A negative belief score, previously defined [2] as the number of PIR domains on the SPI for which the respondent reported any agreement, was also calculated for each respondent.

We also performed logistic regression analyses on the full cohort of insulin-naïve subjects, as well as each of the Latino and AA subsets, for the ability of socio-demographic variables (age, gender, race, diabetes duration, household income, years in the U.S., and education level) to predict willingness to use insulin (not willing at all vs. any degree of willingness) or agreement with each of the 9 PIR domains (any agreement vs. any non-agreement). Analyses were performed with SPSS version 18; statistical significance was $p < 0.05$.

3. Results

We administered the SPI survey to 156 patients over a 4-month period, of whom 136 (87%) reported being completely insulin-naïve; the other 20 respondents reported prior exposure to insulin and were thus excluded from further analyses. Descriptive data are shown in Table 1; the mean age and diabetes duration of all insulin-naïve respondents were 51 ± 10 and 6.9 ± 6.9 years, respectively. There was a preponderance of females and Latino individuals; 94% of respondents were either Latino or AA, and their low-income and low-education status was apparent. Excluding 17 insulin-naïve respondents who did not provide an answer to the question of willingness to use insulin, 57 out of the remaining 119 respondents (48%) reported being completely unwilling to use insulin, even if prescribed by a physician (Table 1). Among the individual PIR domains, the median of the distribution of responses for each domain tended toward agreement with each negative statement regarding insulin.

In comparing Latino vs. AA patients (Table 1), Latino patients were slightly but significantly younger, had a substantially lower education level, were more recently immigrated, and were less willing to accept insulin; 53% of Latino respondents who stated their willingness to accept insulin reported complete unwillingness, as compared to 30% among AA respondents ($p = 0.03$). For each PIR domain, Latinos reported greater agreement with each negative statement (i.e., lower median scores; Table 1), statistically significant for every domain except one, for which a trend was still seen. The negative belief score was also significantly higher for Latino patients (6.9 vs. 4.6; $p < 0.001$).

In the logistic regressions (Table 2), age, diabetes duration, and income were not independent predictors of any of the dependent variables, and relationships for AA were not statistically reliable due to the small numbers of respondents (data not shown). Male gender independently predicted the perception of a restrictive quality of life, and being Latino independently predicted the perception of personal failure. The number of years living in the U.S. was a strong and independent predictor of almost all PIR domains, particularly among Latino patients; more years in the U.S. was associated with less unwillingness and less agreement with each negative statement. Higher education independently predicted a lesser perception of lack of fairness.

4. Discussion

In our unique, low-income, and poorly educated racial minority population of insulin-naïve patients with diabetes, 48% reported a complete unwillingness to accept insulin, a higher prevalence than all previous publications. Using the same SPI survey tool, Polonsky et al. reported a 28.2% prevalence of unwillingness among attendees at a multi-city diabetes conference (35.1% among racial minorities) [2], and Larkin