

Psychological Insulin Resistance in Patients With Type 2 Diabetes

The scope of the problem

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To achieve tight glycemic control in type 2 diabetic patients, it may be advantageous to introduce insulin therapy much earlier in the disease course (1). Unfortunately, many patients are reluctant to begin insulin and may delay starting insulin therapy for significant periods of time (2,3). Recent evidence suggests that more than one-quarter of patients may refuse insulin therapy once it is prescribed (4). Little is actually known about this phenomenon, often termed "psychological insulin resistance" (PIR), how common it may be, or why patients feel this way. Therefore, we developed and distributed a PIR self-report survey to a large multicity sample of patients with type 2 diabetes who were not taking insulin. The survey examined their willingness to take insulin if it was prescribed and to identify perceived attitudinal barriers to insulin therapy.

RESEARCH DESIGN AND METHODS

Participants at several 1-day conferences for people with diabetes (Taking Control of Your Diabetes) conducted in San Diego, California; Raleigh, North Carolina; Portland, Oregon; Minneapolis, Minnesota; Philadelphia, Pennsylvania; and Honolulu and Hilo, Hawaii completed an anonymous one-page survey concerning insulin attitudes. At the beginning of each conference, an announcement to all participants ex-

plained the study, directed them to the questionnaire in their conference syllabus, and asked them to return completed surveys before the conference's conclusion. The study was approved by the Committee on Human Research at the University of California, San Francisco.

An initial questionnaire item assessed willingness to begin insulin therapy, rated from very willing to not unwilling. Patients also rated on a six-point Likert scale how strongly they agreed or disagreed with each of nine items that might explain reluctance to begin insulin therapy. These attitudinal items, drawn from recent descriptive studies (5–7), as well as patient reports, are listed in Table 1.

We examined willingness as a discrete variable, comparing those who reported any degree of willingness (slightly, moderately, or very) with those who were unwilling. This reflects the clinical reality: the patient is either willing or not, and the gradations of willingness are often not of critical concern. The nine attitudinal items were scored in a similar manner, with any degree of agreement considered to be an endorsement of that item.

Stepwise logistic regression was used to assess the impact of patient sex, ethnicity, age, and diabetes duration on insulin therapy willingness. The variables were entered into step 1 of the equation, followed by an ethnicity \times sex interaction term in step 2. Next, we combined the

responses on each of the nine attitudinal items to create a total "negative beliefs" score (representing the number of items to which the subject agreed at least mildly) and included it in an equation to predict willingness. A similar series of logistic regressions, one for each of the belief items, was then used to examine how strongly each of the beliefs was associated with insulin therapy willingness. Finally, to assess the influence of patient demographics on the belief items, a series of nine ANCOVAs was used, one for each belief item.

Because there were relatively few African Americans and Hispanics in the sample, we focused the ethnicity variable on non-Hispanic whites (NHWs) versus all ethnic minorities combined (Asians, African Americans, and Hispanics).

RESULTS— Of an estimated 3,833 diabetic patients attending the nine conferences, 1,267 returned completed questionnaires (33.1%); of these, 708 were type 2 diabetic patients not taking insulin. The mean age was 57.4 years, and the average diabetes duration was 6.9 years. The majority were female (65.8%) and NHWs (53.7%).

Insulin therapy unwillingness was common: 28.2% reported being unwilling to take insulin if prescribed, and the remainder indicated some degree of willingness (slightly willing, 24.0%; moderately willing, 23.3%; and very willing, 24.4%). More females (32.0%) were unwilling than males (21.1%) ($P < 0.001$), and more ethnic minorities (35.1%) were unwilling than NHWs (22.4%) ($P < 0.01$). There were no significant differences by sex across ethnic groups.

Negative attitudes toward insulin were common across the entire sample, with a mean of 3.1 negative beliefs identified per subject. Patients most frequently endorsed beliefs about insulin therapy permanence (45.0%), restrictiveness (45.2%), problematic hypoglycemia (43.3%), personal failure, and low self-efficacy (43.3%) as reasons to avoid insulin therapy.

Unwilling subjects reported signifi-

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Abbreviations: PIR, psychological insulin resistance.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

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Table 1—Attitudes about insulin therapy, unwilling vs. willing subjects

	Unwilling	Willing	Total	P*
Expected harm: Insulin therapy can cause problems, such as blindness	16.7	8.0	10.1	0.005
Illness severity: Taking insulin means my diabetes will become a more serious disease	46.7	35.4	38.1	0.000
Restrictiveness: Insulin therapy would restrict my life; it would be harder to travel, eat out, etc.	56.1	41.6	44.8	0.000
Lack of fairness: I've done everything I was supposed to; if I had to do insulin therapy, it just wouldn't be fair	41.5	21.9	26.8	0.000
Anticipated pain: I couldn't take the needle every day; it would be just too painful	50.8	30.2	34.7	0.000
Problematic hypoglycemia: Insulin therapy might cause serious problems with low blood sugar	49.3	37.9	40.6	0.021
Low self-efficacy: I'm not confident I could handle the demands of insulin therapy	58.1	39.7	43.9	0.000
Personal failure: Insulin therapy would mean I had failed, that I hadn't done a good enough job taking care of my diabetes	55.0	33.6	38.4	0.000
Permanence: Once you start insulin, you can never quit	53.1	42.6	44.9	0.000

Data are percentages of subjects who agree (either mildly, moderately, or strongly) with each barrier. *P values compare differences between willing and unwilling subjects.

cantly more negative insulin therapy beliefs (4.0 ± 2.6) than willing subjects (2.8 ± 2.5) after controlling for ethnicity, sex, age, and diabetes duration ($P < 0.001$). Indeed, unwilling subjects reported greater agreement than willing subjects on all nine belief items (in all cases, $P < 0.001$). The most pronounced differences were the items associated with personal failure, low self-efficacy, anticipated pain, and lack of fairness. Of note, the beliefs were not independent of each other; the median intercorrelation was 0.46.

CONCLUSIONS— In this relatively large multicity sample, we found that PIR is common. Similar to other reports (4), ~28% of insulin-naïve type 2 diabetic patients reported they were unwilling to begin insulin if prescribed, and a substantial number of the remaining sample expressed significant degrees of reluctance. Because ours was a relatively motivated sample, we suspect that the true prevalence of PIR is significantly higher.

Most subjects reported several reasons for avoiding insulin, rather than just one. The negative attitude that most strongly distinguished willing from unwilling subjects was the belief that beginning insulin therapy would indicate they had “failed” proper diabetes self-management. Patients may associate insulin therapy with a sense of personal failure due to common physician practice, where the possibility of insulin therapy may be used as a threat to motivate better patient cooperation (8).

Limitations to this study are apparent. First, the measure of PIR was a single self-reported item that reflected beliefs or expectations, not actual behavior. Without further study, we cannot know whether this translates into true resistance and/or refusal to take insulin once the recommendation is made. Second, the pool of attitudinal items was necessarily limited, and there may be other important contributors to PIR that were not assessed. Third, the sample consisted of a relatively motivated group of patients, which may not be representative of the insulin-naïve type 2 diabetic population as a whole.

These data lead to several implications for clinical practice. Although a patient's clinical presentation of PIR may point to a single issue (e.g., fear of needles), PIR typically represents a complex of beliefs about the meaning of insulin therapy, poor self-efficacy concerning the skills needed for insulin therapy, and a lack of accurate information. Patients may be unable to overcome their insulin therapy reluctance until their personal concerns are recognized and addressed. Therefore, when patients express discomfort with starting insulin, providers might begin by questioning patients about their knowledge of insulin therapy and their underlying beliefs. Brief, personalized interventions that address the unique insulin therapy concerns of patients need to be developed and implemented (8,9). These may include a more proper framing of the insulin therapy message and assuring patients that the need for insulin does not indicate personal failure. Finally, al-

though PIR was seen among patients from all demographic groups, there was significantly greater insulin therapy reluctance among females and ethnic minorities. Clarifying these differences in PIR deserves further study.

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