

Abstract

Background: Long-term advantages and safety profile of insulin are well documented. However, initiation of insulin therapy is often delayed among patients with Type 2 Diabetes Mellitus (T2DM). This study aim to identify the barriers of insulin initiation and psychological insulin resistance (PIR) factors.

Methods: A total of 56 patients with T2DM follow-up at Medical Outpatient Clinic, Hospital Pakar Sultanah Fatimah (HPSF) were involved in this study. Demographic data of the subjects were collected and validated Barriers to Insulin Treatment (BIT) questionnaires were given for participants. The data was analysed with Statistical Package for Social Sciences (SPSS) version 22.

Results: Overall, none of the demographic characteristics resulted in high PIR (mean BIT ≥ 78). Higher mean BIT scores were observed in groups of age 51-65 (68.87, 95% CI 61.11-76.63), males (64.63, 95% CI 56.65-72.61), <5 years T2DM (68.47, 95% CI 58.22-78.72), completed tertiary or above level of education (75.00, 95% CI 54.17-84.97), and were receiving ≥ 3 OHAs (74.00, 95% CI 78.56-94.78). However, the comparison within each respective subgroup showed not significant difference. Subscale 'Scale 5: Fear of hypoglycaemia.' had the highest mean score per statement (6.04 ± 2.83) and was the only identified barrier with high PIR (average BIT ≥ 5.57).

Conclusion: None of the demographic characteristics resulted in high PIR and the differences within the subgroups were not significant. The main barrier of commencing insulin therapy identified in this study was fear of hypoglycaemia. A further and extensive study is needed to strengthen the evidence found in this study.

Background

- T2DM is an increasing prevalent disease across the world.
- Due to the progressive nature of T2DM, majority of patients will inevitably require insulin therapy to maintain adequate glycaemic control when multiple oral hypoglycaemic agents (OHAs) fail maintain normoglycaemia.
- However, initiation of insulin therapy is often delayed, causing T2DM-related complications
- Aim:** To determine patients' view of insulin therapy and to identify the barriers on insulin initiation among the T2DM patients in HPSF.

Methodology

Patient's medical and medication record for the past 3 months are screened (follow up in Medical Out Patient Clinic (MOPC))

Exclusion criteria

- gestational diabetes mellitus
- Type 1 Diabetes Mellitus
- chronic kidney disease (stage 4 -5)
- haemoglobin <11.5 g/dL.

BIT questionnaire is given according to patient's preference language

Data is analysed using SPSS

Results

Table 1: Association between demographic characteristics and BIT Questionnaire scores. A total score on the BIT ≥ 78 was used to indicate high PIR.

Demographic characteristics	BIT scores			
	n (%)	Mean	(95%CI)	p-value
Age, years				
18 - 30	1 (1.79%)	69.00	-	0.903
31 - 50	11 (19.64%)	55.36	37.98 - 72.74	
51 - 65	30 (53.57%)	68.87	61.11 - 76.63	
>65	14 (25.00%)	59.00	50.36 - 67.64	
Gender, n				
Male	35 (62.50%)	64.63	56.65 - 72.61	0.264
Female	21 (37.50%)	60.67	53.11 - 68.23	
T2DM, years				
< 5	17 (30.36%)	68.47	58.22 - 78.72	0.539
5 - 10	24 (42.86%)	62.87	53.69 - 72.05	
>10	15 (26.79%)	60.96	51.28 - 70.64	
Highest level of education				
Primary	14 (25.00%)	59.00	51.88 - 78.84	0.646
Secondary	35 (62.50%)	63.40	55.36 - 70.12	
Tertiary or higher	7 (12.50%)	75.00	54.17 - 84.97	
Number of current active OHA, n				
One	11 (19.64%)	56.00	51.8 - 74.92	0.162
Two	42 (75.00%)	65.05	55.81 - 69.33	
Three and above	3 (5.36%)	74.00	78.56 - 94.78	

Reference

- Harashima S-I, Nishimura A, Inagaki N. Attitudes of patients and physicians to insulin therapy in Japan: an analysis of the Global Attitude of Patients and Physicians in Insulin Therapy study. *Expert Opin Pharmacother.* 2017;18(1):5-11. doi:10.1080/14656566.2016.1260547
- Petrak F, Stridde E, Leverkus F, Crispin AA, Forst T, Plützn A. Development and Validation of a New Measure to Evaluate Psychological Resistance to Insulin Treatment. *Diabetes Care.* 2007;30(9):2199-2204. doi:10.2337/dc06-2042
22. Funnell MM. Overcoming Barriers to the Initiation of Insulin Therapy. *Clin Diabetes.* 2007;25(1):36-38. doi:10.2337/diaclin.25.1.36

Table 4: Barriers to Insulin Treatment (BIT) Questionnaire, item content, mean score and distribution of responses to individual items, mean subscales and total BIT score. Scales are the sum of all responses divided by number of questions. Average of total score is the sum of all scores divided by the total number of items in the scale. An average score per statement ≥ 5.57 was used to indicate high PIR. Scoring: 1 = Strongly Disagree; 10 = Strongly Agree; A/SA, Agree/Strongly; Agree (7-10); ^, positive BIT questionnaire items.

Barriers to Insulin Treatment Questionnaire (BIT) (1-10)	Mean	SD	A/SA%
Scale 1: 'Fear of injections and self-testing'	3.79	2.65	16.07%
1 I am afraid of the pain when injecting insulin.	4.02	2.56	14.29%
2 Besides the pain, I am just afraid of injections.	4.32	2.68	21.43%
3 I am afraid of the pain during regular blood-sugar checks.	3.02	2.59	12.50%
Scale 2: 'Expectations regarding positive insulin-related outcomes'	5.56	2.89	41.07%
^4 Insulin works better than pills.	5.39	3.04	35.71%
^5 People who get insulin feel better.	4.73	2.60	28.57%
^6 Insulin can reliably prevent long-term complications due to diabetes.	6.55	2.78	58.93%
Scale 3: 'Expected hardship from insulin therapy'	4.37	2.51	22.62%
7 I just don't have enough time for regular doses of insulin.	4.45	2.66	23.21%
8 I can't pay as close attention to my diet as insulin treatment requires.	4.41	2.46	21.43%
9 I can't organize my day as carefully as insulin treatment requires.	4.25	2.45	23.21%
Scale 4: 'Stigmatisation by insulin injections'	4.63	3.08	32.74%
10 Injections in public are embarrassing to me. Pills are more discreet.	5.41	3.27	42.86%
11 Regular insulin treatment causes feelings of dependence.	4.79	2.76	30.36%
12 When people inject insulin, it makes them feel like drug addicts.	3.70	3.00	25.00%
Scale 5: 'Fear of hypoglycaemia'	6.04	2.83	47.32%
13 An insulin overdose can lead to extremely low blood-sugar levels ("hypoglycemia"). I am afraid of the unpleasant accompanying symptoms.	6.07	2.87	48.21%
14 An insulin overdose can lead to extremely low blood-sugar levels ("hypoglycemia"). I have concerns about possible permanent damage to my health.	6.00	2.82	46.43%
Total (sum score 14 items, 3 negatively recorded)	63.75	21.36	
Average of total scores	4.89	1.53	

Discussion

- Overall, none of the demographic characteristics resulted in high PIR. Patients who were in the age group of 51-65, males, <5 years T2DM, completed tertiary or above level of education and were accepting ≥ 3 OHAs had higher mean BIT score. However, the differences in the subgroups were not significant.
- The main barrier of commencing insulin therapy was fear of hypoglycaemia.

Limitation

- The main limitation of the study is the small sample size. Small sample size might not be able to reflect the exact BIT and PIR.
- Clinicians' belief and attitudes, which was another important factor that may contribute to delay in insulin initiation. However, the barriers in insulin initiation determined in this study were solely due to factors by the patients.

Conclusion

- None of the demographic characteristics resulted in high PIR and the differences within the subgroups were not significant.
- A further and extensive study is needed to strengthen the evidence found in this study.