

PDB110

THE UNMET MEDICAL NEEDS IN CURRENT ANTIDIABETIC INJECTABLE THERAPY (AIT) IN CHINA: FROM PATIENTS' PERSPECTIVE

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OBJECTIVES

- Timely initiation of AIT could help patients achieve glycemic target, minimize AIT-related side effect¹ Patients' satisfaction with AIT also played an important role in managing diabetes since higher satisfaction with AIT could lead to better adherence and glycemic control, which contribute to less diabetic complication, longer life expectancy and better quality of life ².
- This study aims to understand T2DM patients' unmet medical needs in AIT regarding concerns about initiating AIT, satisfaction with current AIT, aspects of AIT that need improvement, and AIT training burden.

METHODS

- This is a part of the PURPOSE study (Patient, Nurse, and Physician Survey on Unmet Medical Needs in Injectable Diabetes Treatments), a cross-sectional survey conducted in 13 representative cities across China in 2019.
- T2DM patients who visited the endocrinology department during the study period, aged over 18, and were treated with AIT for at least one month were invited to participate in this research. Specifically, the urgency of improvement for different aspects of AIT was measured with a 5-point scale (1: not urgent at all, 5: extremely urgent). Satisfaction with current AIT was measured with a 5-point scale (1: not satisfied at all, 5: very satisfied). Degree of mastery of AIT training was measured with a 5-point scale (1: not mastered, 5: completely mastered).
- Descriptive statistics were conducted using R software, version 3.5.2.

RESULTS

Baseline characteristics

- The mean (SD) age of the 500 patients was 55.1 (11.8) years with mean disease duration of 7.6 (6.4) years. Among them, 48.2% were male and 21.8% were glucagon-like peptide-1 receptor agonist (GLP-1 RA) users (**Table 1**).

Table 1 Baseline characteristics of T2DM patients and their current AIT

Characteristics	Total (N=500)	GLP-1 RA users (N=109)	Insulin users (N=391)
Age (year), mean (SD)	55.1 (11.8)	52.8 (10.5)	55.8 (12.0)
Duration of AIT use (year), mean (SD)	3.8 (4.4)	2.4 (3.5)	4.2 (4.6)
Diabetes duration (year), mean (SD)	7.6 (6.4)	5.9 (5.9)	8.1 (6.5)
BMI (kg/m ²), mean (SD)	24.9 (3.6)	26.5 (3.8)	24.5 (3.4)
Sex (%)			
Female	259 (51.8)	55 (50.5)	204 (52.2)
Male	241 (48.2)	54 (49.5)	187 (47.8)
Working status (%)			
Unemployed	24 (4.8)	2 (1.8)	22 (5.6)
Retired	254 (50.8)	40 (36.7)	214 (54.7)
Employed	222 (44.4)	67 (61.5)	155 (39.6)
Insurance type (%)			
URRBMI	105 (21.0)	21 (19.3)	84 (21.5)
UEBMI	371 (74.2)	84 (77.1)	287 (73.4)
Publicly funded free medical care	10 (2.0)	0 (0.0)	10 (2.6)
No medical insurance	14 (2.8)	4 (3.7)	10 (2.6)
Highest education level (%)			
Middle school or lower	118 (23.6)	16 (14.7)	102 (26.1)
High school or technical secondary school	178 (35.6)	60 (55.0)	118 (30.2)
Bachelor or college degree	191 (38.2)	29 (26.6)	162 (41.4)
Master or PhD	13 (2.6)	4 (3.7)	9 (2.3)
Received AIT training (%)			
No, but interested in	30 (6.0)	4 (3.7)	26 (6.6)
No, and no interest	46 (9.2)	7 (6.4)	39 (10.0)
Yes	424 (84.8)	98 (89.9)	326 (83.4)
Total monthly expense on AIT (CNY), mean (SD)	788.6 (585.5)	1328.1 (649.6)	638.2 (466.6)
Monthly out-of-pocket expense on AIT (CNY), mean (SD)	414.3 (509.1)	996.4 (737.7)	252.0 (244.5)
Injection device (%)			
Pen	486 (97.2)	106 (97.2)	380 (97.2)
Syringe	13 (2.6)	3 (2.8)	10 (2.6)
Pump	1 (0.2)	0 (0.0)	1 (0.3)
Times of needle used before disposal, mean (SD)	4.3 (4.8)	3.9 (4.2)	4.4 (4.9)
Suspension was needed before injection (%)			
Yes	184 (36.8)	13 (11.9)	171 (43.7)
No	316 (63.2)	96 (88.1)	220 (56.3)
Pre-injection dose setting was needed (%)			
Yes	387 (77.4)	73 (67.0)	314 (80.3)
No	113 (22.6)	36 (33.0)	77 (19.7)
Experienced side effect (%)			
Yes	176 (35.2)	20 (18.3)	156 (39.9)
No	324 (64.8)	89 (81.7)	235 (60.1)

SD: standard deviation; URRBMI: Urban and Rural Resident Basic Medical Insurance; UEBMI: Urban Employment Basic Medical Insurance

Concerns when initiating AIT

- The top three concerns about initiating AIT were **it is very troublesome to get injections every day** (58.0%), **I am worried about insulin dependence (for insulin users)** (42.6%), and **I am afraid of injection or I feel fear when thinking of a needle** (37.0%) (**Figure 1**).

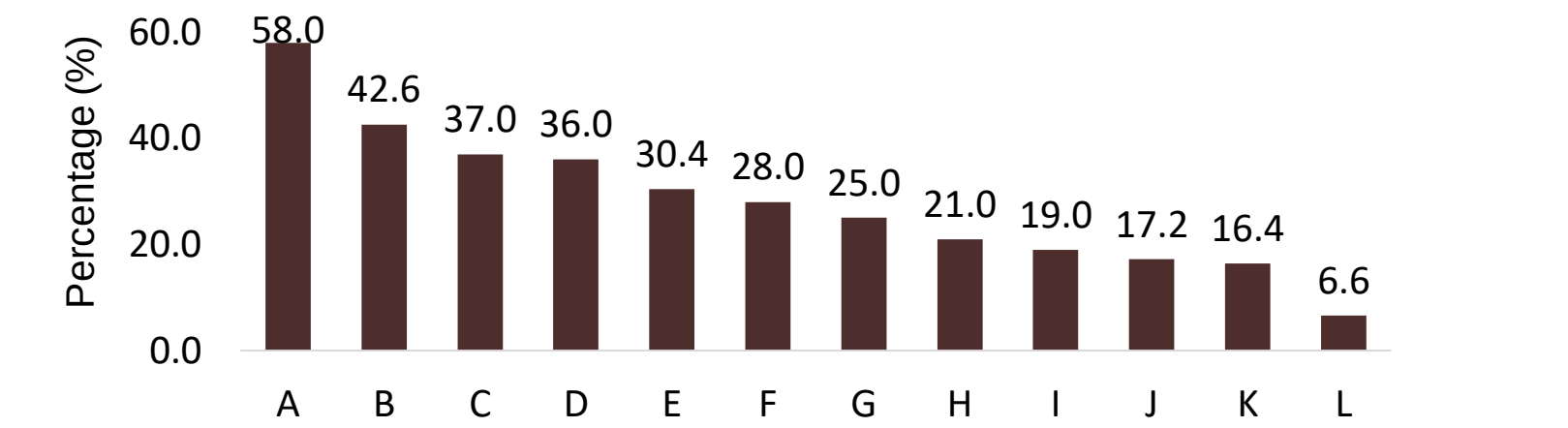


Figure 1 Percentage of patients choosing specific aspect as concern when initiating AIT (n=500)

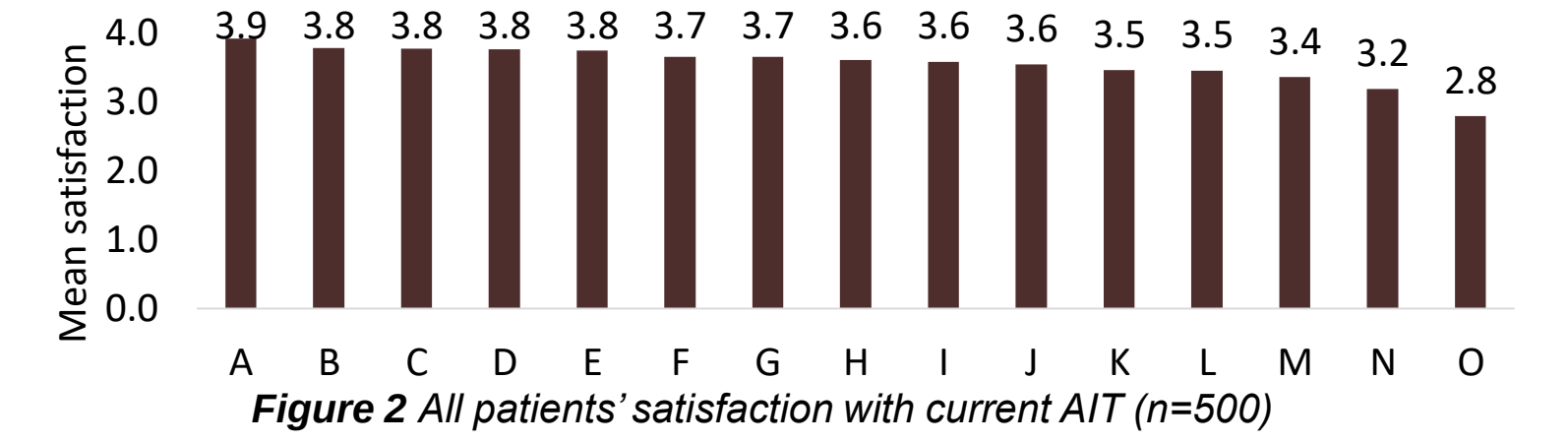
A	It is very troublesome to get injections every day
B	I am worried about insulin dependence (for insulin users)
C	I am afraid of injection or I feel fear when thinking of a needle
D	If I get injections, it means my medical condition is getting worse
E	I am worried about injection site reactions such as lumps, rashes, etc.
F	I am worried about hypoglycemia
G	I do not want others to know that I get injections
H	I am worried that it may bring burden to my family
I	I am worried that I may not be able to master self-injection techniques
J	I am worried that it may have negative impacts on my work
K	I am worried about weight gain
L	Other concerns

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- Meneghini, Luigi F. "Early insulin treatment in type 2 diabetes: what are the pros?." Diabetes care vol. 32 Suppl 2,Suppl 2 (2009): S266-9. doi:10.2337/dc09-S320
- 中国2型糖尿病防治指南(2017年版)[J].中国实用内科杂志,2018,38(04):292-344.

Satisfaction with current AIT

- Overall mean (SD) satisfaction score with current AIT was 4.0 (0.6). Patients were least satisfied with **medical expenses**, **convenience of drug portability/storage**, and **injection site reaction (such as lumps and rashes)**, mean(SD) was 2.8 (1.1), 3.2 (1.0), 3.4 (1.0), respectively. (**Figure 2**).



A	Blood glucose control
B	Convenience of injection operation after dose is set
C	Convenience of refill and needle installation
D	Fixed injection timing (such as before meals)
E	Frequency of injection
F	Suspension required before each injection
G	Dose setting required before each injection
H	Convenience of needle replacement
I	Inability to eat immediately after drug injection (need to wait for a while)
J	Needle design (such as thickness, length, and visibility of the needle)
K	Discomfort after injection (such as palpitation, trembling, cold sweat)
L	Weight gain after injection
M	Injection site reaction (such as lumps and rashes)
N	Convenience of drug portability/storage
O	Medical expenses

Aspects that need improvement

- Among 500 patients, 11 (2.2%) patients did not report aspects that need improvement (not shown in **Figure 3** & **Figure 4**). **High medical expenses**, **inconvenience of drug portability/storage**, and **injection site reaction (such as lumps and rashes)** were the three aspects most frequently cited and most urgent for improvement (percentage of patients asking for improvement: 61.4%, 50.2% and 36.4%; mean urgency score: 4.1, 3.9 and 3.6, respectively).
- There was a slight difference between GLP-1 RA users and insulin users in urgency of improvement for each aspect. GLP-1 RA users thought that **blood glucose control** (3.9) was more urgent for improvement while insulin users considered **injection site reaction (such as lumps and rashes)** (3.6) and **hypoglycemia after injection** (3.6) as more urgent for improvement (**Figure 3**, **Figure 4**).

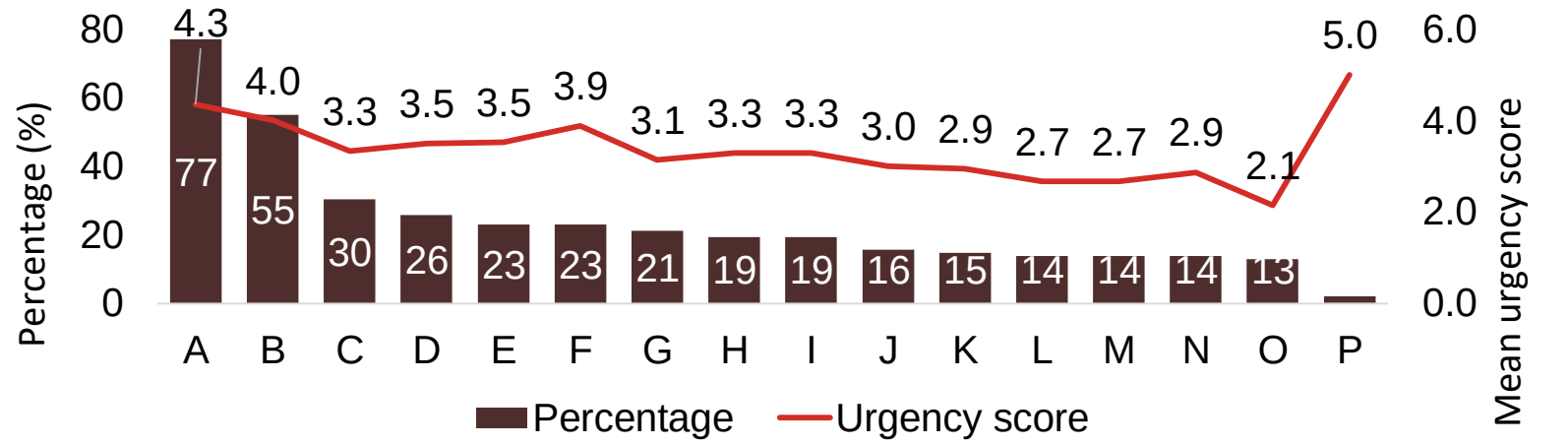


Figure 3 GLP-1 RA users' opinions on aspects needing improvement and the urgency of improvement (n=109)

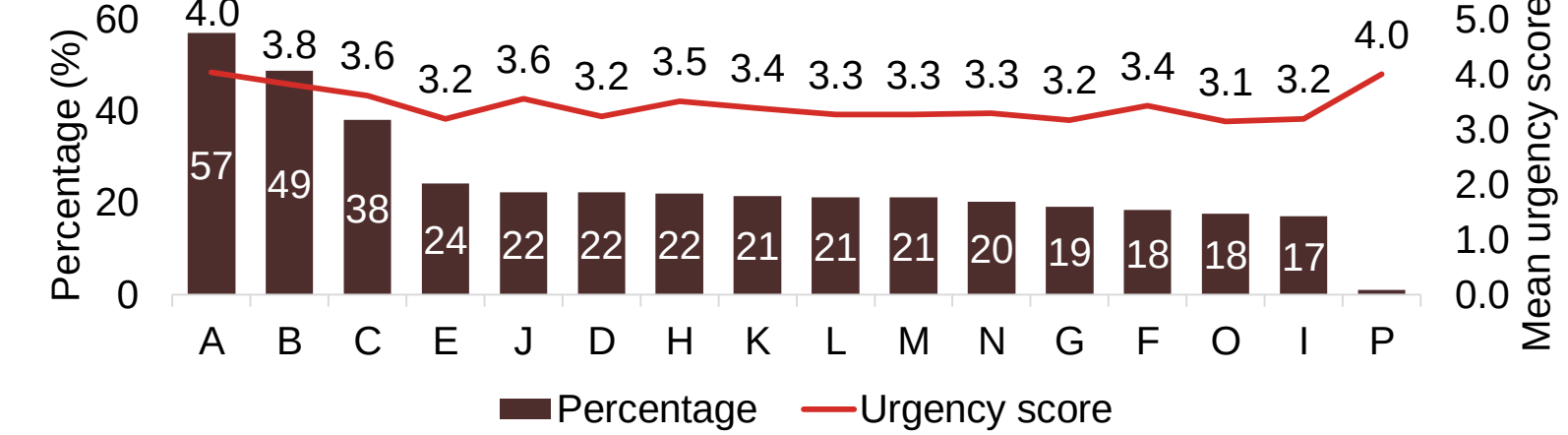
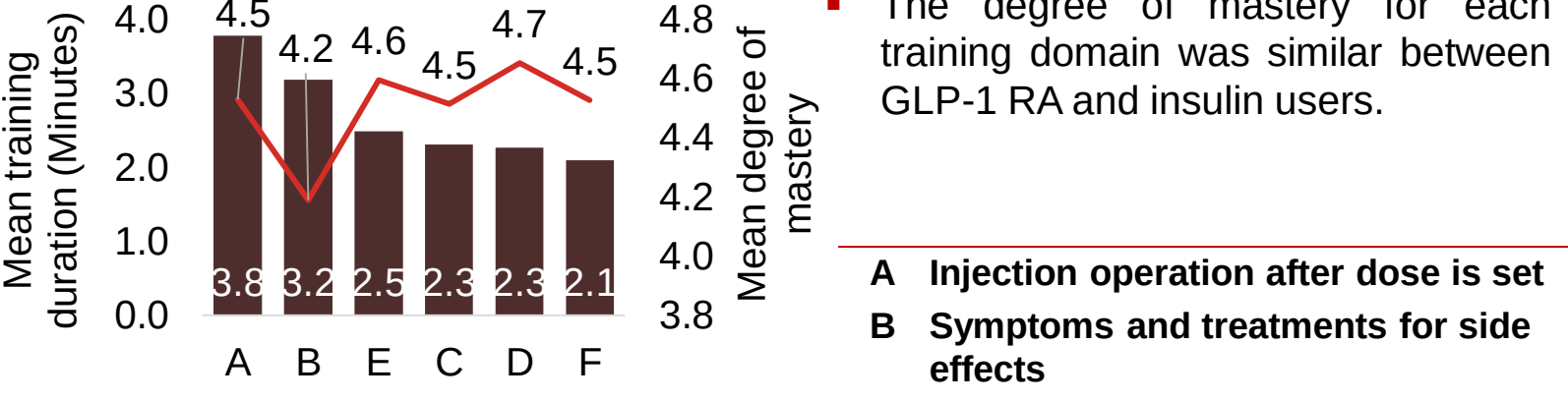


Figure 4 Insulin users' opinions on aspects needing improvement and the urgency of improvement (n=391)

A	High medical expenses
B	Inconvenience of drug portability/storage
C	Injection site reaction (such as lumps and rashes)
D	Needle design (such as thickness, length, and visibility of the needle)
E	Inconvenience of refill and needle installation
F	Blood glucose control
G	Dose setting required before each injection
H	Inconvenience of needle replacement
I	Inconvenience of injection operation after dose is set
J	Hypoglycemia after injection
K	Weight gain after injection
L	High frequency of injection
M	Fixed injection timing (such as before meals)
N	Inability to eat immediately after injection (need to wait for a while)
O	Suspension required before each injection
P	Other aspects

Training burden

- Among 500 patients, 424 (84.8%) have received training on AIT with mean (SD) training duration as 14.1 (9.7).
- Injection operation after dose is set** and **symptoms and treatments for side effects** were the most time-consuming training domains for both GLP-1 RA and insulin users. The third most time-consuming training domain was **drug storage and portability** for GLP-1 RA users, and **pre-injection dose setting** for insulin users (**Figure 5**, **Figure 6**).
- The degree of mastery for each training domain was similar between GLP-1 RA and insulin users.



CONCLUSIONS

- AIT with more convenient drug portability/storage, less injection site reactions, easier assembling or refilling procedures, and more user-friendly needle design are likely to help improve patients' injection experience.
- AIT with less steps for injection, less side effects, more convenient drug portability/storage are likely to help reduce training duration and make it easier for patients to master the contents of injection training.



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