Original Article

Clinical experience with insulin detemir, biphasic insulin aspart and insulin aspart in people with type 2 diabetes: Results from the Marrakech cohort of the A_1chieve study

El Ansari Nawal

Department of Endocrinology and Metabolic diseases, Mohammed VI University Hospital, Marrakech Morocco

ABSTRACT

Background: The A_1chieve, a multicentric (28 countries), 24-week, non-interventional study evaluated the safety and effectiveness of insulin detemir, biphasic insulin aspart and insulin aspart in people with T2DM (n = 66,726) in routine clinical care across four continents. **Materials and Methods:** Data was collected at baseline, at 12 weeks and at 24 weeks. This short communication presents the results for patients enrolled from Marrakech, Morocco. **Results:** A total of 196 patients were enrolled in the study. Four different insulin analogue regimens were used in the study. Study patients had started on or were switched to biphasic insulin aspart (n = 71), insulin detemir (n = 83), insulin aspart (n = 5), basal insulin plus insulin aspart (n = 14) and other insulin combinations (n = 23). At baseline glycaemic control was poor for both insulin naïve (mean HbA_1c: 9.3%) and insulin user (mean HbA_1c: 9.3%) groups. After 24 weeks of treatment, both the study groups showed improvement in HbA_1c (insulin naïve: −2.3%, insulin users: −1.9%). SADR's including major hypoglycaemic events did not occur in any of the study patients. **Conclusion:** Starting or switching to insulin analogues was associated with improvement in glycaemic control with a low rate of hypoglycaemia.

Key words: A_1chieve study, insulin analogues, Marrakech, type 2 diabetes mellitus

Introduction

Diabetes prevalence in Morocco is estimated to be 6.4%.[1] Fear of hypoglycaemia and gain in body weight are barriers for initiation of insulin therapy.[2] Modern insulin analogues are a convenient new approach or tool to glycaemic control, associated with low number of hypoglycaemia and favourable weight change.[3] A_1chieve, a multinational, 24-week, non-interventional study, assessed the safety and effectiveness of insulin analogues in people with T2DM (n = 66,726) in routine clinical care.[4] This short communication presents the results for patients enrolled from Marrakech, Morocco.

Access this article online	
Quick Response Code:	Website: www.ijem.in
	DOI: 10.4103/2230-8210.122041

Materials and Methods

Please refer to editorial titled: The A_1chieve study: Mapping the Ibn Battuta trail.

Results

A total of 196 patients were enrolled in the study. The patient characteristics for the entire cohort, divided as insulin-naïve and insulin users is shown in the Table 1. Glycaemic control at baseline was poor in this population. The majority of patients (42.3%) started on or were switched to insulin detemir. Other groups were biphasic insulin aspart (n = 71), insulin aspart (n = 5), basal insulin plus insulin aspart (n = 14) and other insulin combinations (n = 23).

Corresponding Author: Prof. Nawal Elansari, Endocrinology and Metabolic diseases Department, Mohammed VI University Hospital, Marrakech, Morocco. E-mail: elansarinawal@yahoo.fr

After 24 weeks of treatment, overall hypoglycaemic events or episodes reduced from 10.3 events/patient-year to 7.2 events/patient-year in insulin user group whereas overall hypoglycaemia increased from 0.4 events/patient-year to 2.3 events/patient-year in the insulin naïve group. However, this hypoglycaemia incidence in insulin naive group at 24 weeks was still lower than that observed in insulin users at baseline. SADRs including major hypoglycaemic events did not occur in any of the study patients. Blood pressure decreased from baseline while overall lipid profile and quality of life improved after 24 weeks [Tables 2 and 3].

All parameters of glycaemic control improved from baseline to study end in the total cohort [Table 4].

Table 1: Overall demographic data

Parameters	Insulin naïve	Insulin users	All
Number of participants	125	71	196
Male *N* (%)	50 (40.0)	28 (39.4)	78 (39.8)
Female *N* (%)	75 (60.0)	43 (60.6)	118 (60.2)
Age (years)	58.2	54.8	57.0
Weight (kg)	73.4	71.2	72.6
BMI (kg/m^2)	27.0	26.2	26.7
Duration of DM (years)	8.9	11.2	9.8
No therapy			8
>2 OGLD	1		1
HbA$_1$c	9.3	9.3	9.3
FPG (mmol/L)	12.1	11.2	11.8
PPPG (mmol/L)	13.9	13.9	13.9
Macrovascular complications, *N* (%)	18 (14.4)	12 (16.9)	30 (15.3)
Microvascular complications, *N* (%)	39 (31.2)	28 (39.4)	67 (34.2)
Pre-study therapy, *N* (%)			
Insulin users			71 (36.2)
OGLD only			117 (59.7)
No therapy			8 (4.0)
Baseline therapy, *N* (%)			
Insulin detemir±OGLD			83 (42.3)
Insulin aspart±OGLD			5 (2.6)
Basal+insulin aspart±OGLD			14 (7.1)
Biphasic insulin aspart±OGLD			71 (36.2)
Others			23 (11.7)

BMI: Body mass index, OGLD: Oral glucose-lowering drug, HbA$_1$c: Glycated hemoglobin A$_1$c, FPG: Fasting plasma glucose, PPPG: Postprandial plasma glucose, DM: Diabetes mellitus

Biphasic insulin aspart ± OGLD

Of the total cohort, 71 patients started on biphasic insulin aspart ± OGLD, of which 38 (53.5%) were insulin naïve and 33 (46.5%) were insulin users. After 24 weeks of treatment, hypoglycaemic events or episodes increased for both the groups (insulin naïve: from 0.7 events/patient-year to 3.7 events/patient-year and insulin users: from 9.1 events/patient-year to 10.0 events/patient-year). An increase in body weight was observed for both the groups. Quality of life improved at the end of the study [Tables 5 and 6].

All parameters of glycaemic control improved from baseline to study end in those who started on or were switched to biphasic insulin aspart for both insulin naïve and insulin user groups [Table 7].

Table 2: Overall safety data

Parameter	*N*	Baseline	Week 24	Change from baseline
Hypoglycaemia (insulin naïve), events/participant-year				
All	125	0.4	2.3	1.9
Nocturnal		0.1	1.1	1.0
Major		0.0	0.0	0.0
Hypoglycaemia (insulin users), events/participant-year				
All	71	10.3	7.2	−3.1
Nocturnal		4.4	0.8	−3.6
Major		0.7	0.0	−0.7
Body weight, kg				
Insulin naïve	99	74.0	75.7	1.8
Insulin users	53	71.5	73.3	1.8
Lipids and BP (insulin naïve)				
LDL-C, mean (mmol/L), (*N*, % <2.5 mmol/L)	70	2.9 (15, 21.4)	2.5 (34, 63.0)	−0.4
HDL-C, mean (mmol/L), (*N*, % >1.0 mmol/L)	71	1.0 (45, 63.4)	1.1 (34, 61.8)	0.0
TG, mean (mmol/L), (*N*, % <2.3 mmol/L)	77	1.5 (69, 89.6)	1.3 (56, 96.6)	−0.3
SBP, mean (mmHg), (*N*, % <130 mmHg)	120	131.2 (59, 49.2)	128.6 (60, 56.1)	−2.6
Lipids and BP (insulin users)				
LDL-C, mean (mmol/L), (*N*, % <2.5 mmol/L)	30	3.3 (12, 40.0)	2.6 (6, 30.0)	−0.7
HDL-C, mean (mmol/L), (*N*, % >1.0 mmol/L)	29	1.1 (23, 79.3)	1.2 (16, 80.0)	0.0
TG, mean (mmol/L), (*N*, % <2.3 mmol/L)	34	1.6 (32, 94.1)	1.4 (20, 95.2)	−0.2
SBP, mean (mmHg), (*N*, % <130 mmHg)	67	127.4 (33, 49.3)	124.7 (35, 59.3)	−2.7
Quality of life, VAS scale (0-100)				
Insulin naïve	111	51.7	80.8	29.0
Insulin users	63	55.7	74.4	18.7

BP: Blood pressure, LDL-C: Low-density lipoprotein cholesterol, HDL-C: High-density lipoprotein cholesterol, TG: Triglycerides, SBP: Systolic blood pressure, VAS: Visual analogue scale

Basal + insulin aspart ± OGLD

Of the total cohort, 14 patients started on or switched to basal + insulin aspart ± OGLD, of which 1 (7.1%) was insulin naïve and 13 (92.9%) were insulin users. After 24 weeks of treatment, hypoglycemia reduced from 11.0 events/participant-year to 0.0 events/participant-year [Tables 8 and 9].

Table 3: Insulin dose

Insulin dose, U/day	*N*	Pre-study	*N*	Baseline	*N*	Week 24
Insulin naïve	0	0	125	28.0	111	34.5
Insulin users	71	43.2	71	43.4	63	51.8

Table 4: Overall efficacy data

Parameter	*N*	Baseline	Week 24	Change from baseline
Glycaemic control (insulin naïve)				
HbA_1c, mean (%)	89	9.3	7.1	−2.3
FPG, mean (mmol/L)	86	12.1	6.4	−5.6
PPPG, mean (mmol/L)	59	13.9	8.5	−5.5
Glycaemic control (insulin users)				
HbA_1c, mean (%)	49	9.3	7.4	−1.9
FPG, mean (mmol/L)	38	11.2	6.7	−4.5
PPPG, mean (mmol/L)	26	13.9	8.8	−5.1
Achievement of HbA_1c <7.0% at week 24				
Insulin naïve (% of patients)	101	49.5		
Insulin users (% of patients)	59	32.2		

HbA_1c: Glycated haemoglobin A_1c, FPG: Fasting plasma glucose, PPPG: Postprandial plasma glucose

Table 5: Biphasic insulin aspart±oral glucose-lowering drug safety data

Parameter	*N*	Baseline	Week 24	Change from baseline
Hypoglycaemia, events/patient-year				
Insulin naïve	38	0.7	3.7	3.0
Insulin users	33	9.1	10.0	0.9
Body weight, kg				
Insulin naïve	29	70.6	73.9	3.3
Insulin users	25	74.9	76.9	2.0
Quality of life, VAS scale (0-100)				
Insulin naïve	32	53.1	78.9	25.9
Insulin users	30	54.2	74.2	19.9

VAS: Visual analogue scale

Table 6: Insulin dose

Insulin dose, U/day	*N*	Pre-study	*N*	Baseline	*N*	Week 24
Insulin naïve	0	0	38	34.7	32	49.1
Insulin users	33	40.3	33	42.1	30	45.7

All parameters of glycaemic control improved from baseline to study end in those who started on or were switched to basal + insulin aspart ± OGLDs [Table 10].

Insulin detemir ± OGLD

Of the total cohort, 83 patients started on insulin detemir ± OGLD, of which 74 (89.2%) were insulin naïve and 9 (10.8%) were insulin users. After 24 weeks of starting or switching to insulin detemir, hypoglycaemic events reduced from 2.9 events/patient-year to 1.9 events/

Table 7: Biphasic insulin aspart±oral glucose-lowering drug efficacy data

Parameter	*N*	Baseline	Week 24	Change from baseline
Glycaemic control (insulin naïve)				
HbA_1c, mean (%)	21	10.1	7.5	−2.7
FPG, mean (mmol/L)	21	14.6	6.7	−7.8
PPPG, mean (mmol/L)	16	16.5	8.7	−7.8
Glycaemic control (insulin users)				
HbA_1c, mean (%)	19	9.2	7.7	−1.5
FPG, mean (mmol/L)	16	12.5	6.6	−5.8
PPPG, mean (mmol/L)	16	14.5	9.0	−5.5

HbA_1c: Glycated haemoglobin A_1c, FPG: Fasting plasma glucose, PPPG: Postprandial plasma glucose

Table 8: Basal+insulin aspart±oral glucose-lowering drug safety data

Parameter	*N*	Baseline	Week 24	Change from baseline
Hypoglycaemia, events/patient-year				
Insulin users	13	11.0	0.0	−11.0
Body weight, kg				
Insulin users	11	63.5	65.3	1.7
Quality of life, VAS scale (0-100)				
Insulin users	11	52.2	76.8	24.6

VAS: Visual analogue scale

Table 9: Insulin dose

Insulin dose, U/day	*N*	Pre-study	*N*	Baseline	*N*	Week 24
Insulin users	13	43.6	13	46.1	11	59.1

Table 10: Basal+insulin aspart±oral glucose-lowering drug efficacy data

Parameter	*N*	Baseline	Week 24	Change from baseline
Glycaemic control (insulin naïve)				
HbA_1c, mean (%)	11	9.9	7.1	−2.8
FPG, mean (mmol/L)	8	10.1	6.3	−3.8
PPPG, mean (mmol/L)	3	16.2	7.7	−8.5

HbA_1c: Glycated haemoglobin A_1c, FPG: Fasting plasma glucose, PPPG: Postprandial plasma glucose

patient-year in insulin user group while hypoglycaemia increased from 0.4 events/patient-year to 0.6 events/patient-year in insulin naïve group. Quality of life improved at 24 weeks [Tables 11 and 12].

All parameters of glycaemic control improved from baseline to study end in those who started on or were switched to insulin detemir ± OGLDs for both insulin-naïve and insulin user groups [Table 13].

Table 11: Insulin detemir±oral glucose-lowering drug safety data

Parameter	*N*	Baseline	Week 24	Change from baseline
Hypoglycaemia, events/patient-year				
Insulin naïve	74	0.4	0.6	0.2
Insulin users	9	2.9	1.9	−1.0
Body weight, kg				
Insulin naïve	59	75.1	75.6	0.5
Insulin users	5	72.3	71.8	−0.5
Quality of life, VAS scale (0-100)				
Insulin naïve	67	52.7	81.4	28.7
Insulin users	7	70.6	70.7	0.1

VAS: Visual analogue scale

Table 12: Insulin dose

Insulin dose, U/day	*N*	Pre-study	*N*	Baseline	*N*	Week 24
Insulin naïve	0	0	74	19.4	67	23.7
Insulin users	9	20.4	9	17.6	7	23.1

Table 13: Insulin detemir±oral glucose-lowering drug efficacy data

Parameter	*N*	Baseline	Week 24	Change from baseline
Glycaemic control (insulin naïve)				
HbA$_1$c, mean (%)	58	9.0	7.0	−2.0
FPG, mean (mmol/L)	55	11.3	6.4	−4.9
PPPG, mean (mmol/L)	34	12.9	8.4	−4.6
Glycaemic control (insulin users)				
HbA$_1$c, mean (%)	5	8.2	7.3	−0.9
FPG, mean (mmol/L)	5	10.4	7.3	−3.1
PPPG, mean (mmol/L)	1	15.5	10.0	−5.6

HbA$_1$c: Glycated haemoglobin A$_1$c, FPG: Fasting plasma glucose, PPPG: Postprandial plasma glucose

Insulin aspart ± OGLD

Of the total cohort, 5 patients started on insulin aspart ± OGLD of which 1 (20.0%) was insulin naïve and 4 (80.0%) were insulin users. After 24 weeks of treatment, hypoglycaemic events reduced from 6.5 events/patient-year to 4.3 events/patient-year in insulin user group. Mean HbA$_1$c and mean FPG improved from baseline to study end who started on or were switched to insulin aspart ± OGLDs for insulin user group. Quality of life improved in both insulin naïve and insulin user groups.

Conclusion

Our study reports improved glycaemic control and quality of life following 24 weeks of treatment with any of the insulin analogues (Biphasic insulin aspart; Basal + insulin aspart; insulin detemir; Insulin aspart) with or without OGLD. SADR's including major hypoglycaemic events did not occur in any of the study patients. Though the findings are limited by number of patients, still the trend indicates that insulin analogues can be considered effective and possess a safe profile for treating type 2 diabetes in Marrakech, Morocco.

References

1. IDF Diabetes Atlas. 5th ed.. 2011. Available from: http://www.idf.org/atlasmap/atlasmap [Last accessed on 2013 Jun 10].
2. Korytkowski M. When oral agents fail: Practical barriers to starting insulin. Int J Obes Relat Metab Disord 2002;26 Suppl 3:S18-24.
3. Hirsch IB. Insulin analogues. N Engl J Med 2005;352:174-83.
4. Shah SN, Litwak L, Haddad J, Chakkarwar PN, Hajjaji I. The A1chieve study: A 60 000-person, global, prospective, observational study of basal, meal-time, and biphasic insulin analogs in daily clinical practice. Diabetes Res Clin Pract 2010;88 Suppl 1:S11-6.

Cite this article as: Nawal E. Clinical experience with insulin detemir, biphasic insulin aspart and insulin aspart in people with type 2 diabetes: Results from the Marrakech cohort of the A$_1$chieve study. Indian J Endocr Metab 2013;17:S404-7.

Source of Support: Nil, **Conflict of Interest:** None declared.