



Clinical presentation and outcomes of Haitian youth with diabetes receiving continuity of care in a specialized clinic in Montrouis, Haiti



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Introduction

Type 1 Diabetes – Haiti and low-income countries:

- **Insufficient data** on prevalence in these settings. (1)
- High risk of **mortality**, frequent **diabetic ketoacidosis (DKA)**, high rates of **early diabetes complications**. (2-3)
- Clinical presentation and genetic markers for type 1 diabetes in non-Caucasian populations are not well described. (4)
- Clinical observation suggests that **phenotypes, auto-immune and genetic markers may be distinct**. (5)

Objective

To describe the **clinical presentation, glycemic control, and chronic complications** of diabetes and their predictors in Haitian youth residing in Haiti.

Methods

Study group

DEterminants Sociaux et Individuels de santé en Diabète pEdiatrique (DESIDE)



Setting

- Kay Mackenson clinic in Montrouis, Haiti (second largest clinic for pediatric patients with non-communicable diseases in Haiti).
- Access to specialized care, insulin & medical supplies (Life for a child supported) and education free of charge.

Study Design and Population

- Retrospective chart review between Jan 2013 and May 2018.
- Insulin-dependent diabetes in youth <25 years old at diagnosis.

Outcome measures:

- **Clinical phenotypes:** anthropometrics, symptoms, suspected diabetic ketoacidosis (DKA) / coma at diagnosis, yearly total daily insulin dose yearly after diagnosis
- **Quarterly Hemoglobin A1c:** proxy of glycemic control
- **Complications:** hypertension, chronic complications (cataract, retinopathy, nephropathy, neuropathy) and their predictors

Statistics:

- **Predictors:** descriptive statistics; linear and logistic regression to determine predictors of mean A1c and of complications

Results

Table 1: Baseline Characteristics

Variable	N (%) or Mean±SD
N	91
Female	55 (60%)
Mean age [y]	18 ± 5
Diabetes Duration [y]	4 ± 3.5
Suspected ketoacidosis / coma at presentation	55 (60%) / 18 (20%)
BMI z-score, at presentation	-1.7 ± 1.4
BMI z-score, most recent	-0.9 ± 1.0
Total daily insulin dose, most recent [IU/kg/day]	0.48 ± 0.28
Delay to presentation to specialized clinic [y]	1.6 ± 3.3
≥ 2 facilities consulted prior to diagnosis of diabetes	61 (78%)

Figure 1: Age at diagnosis

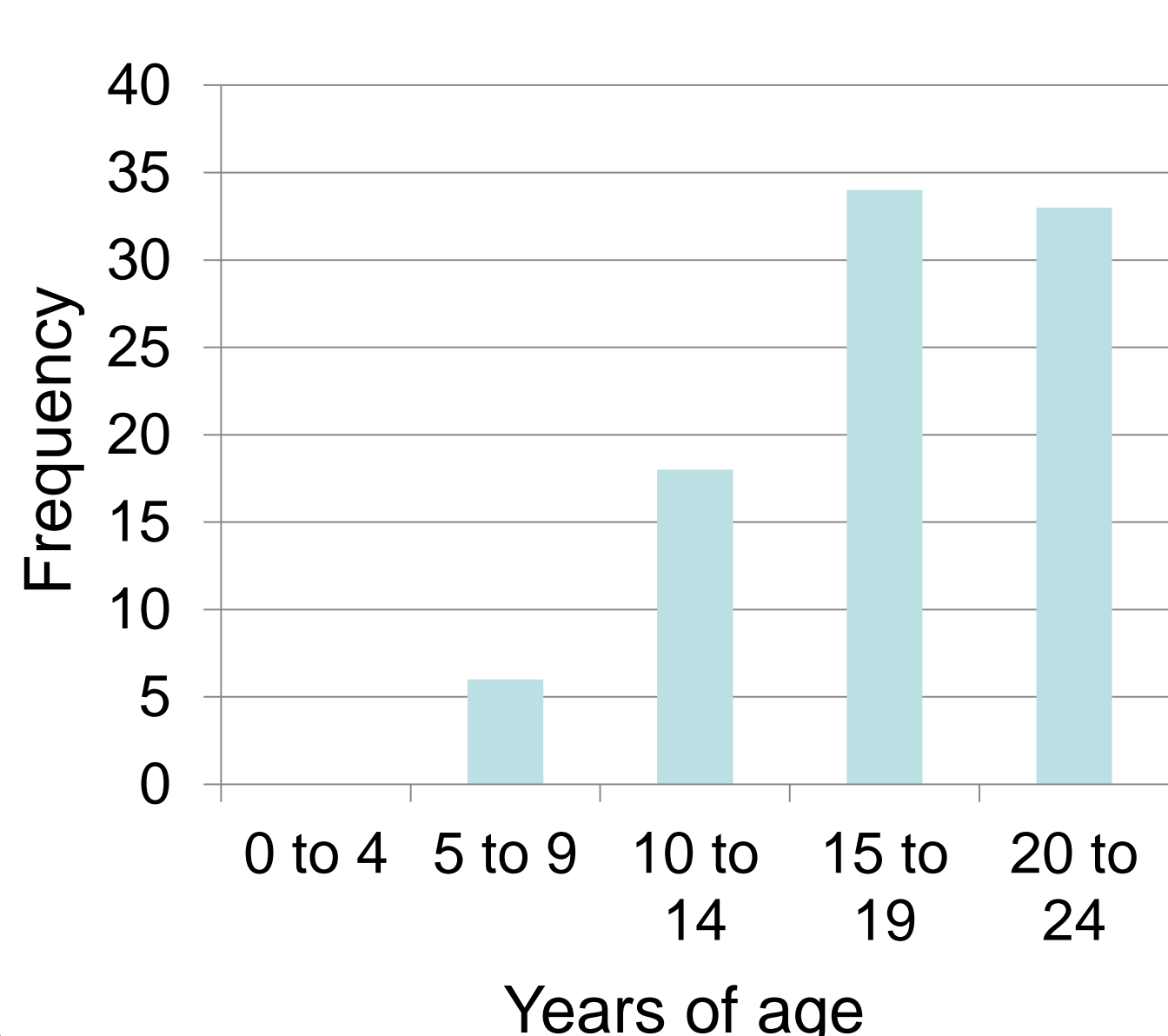
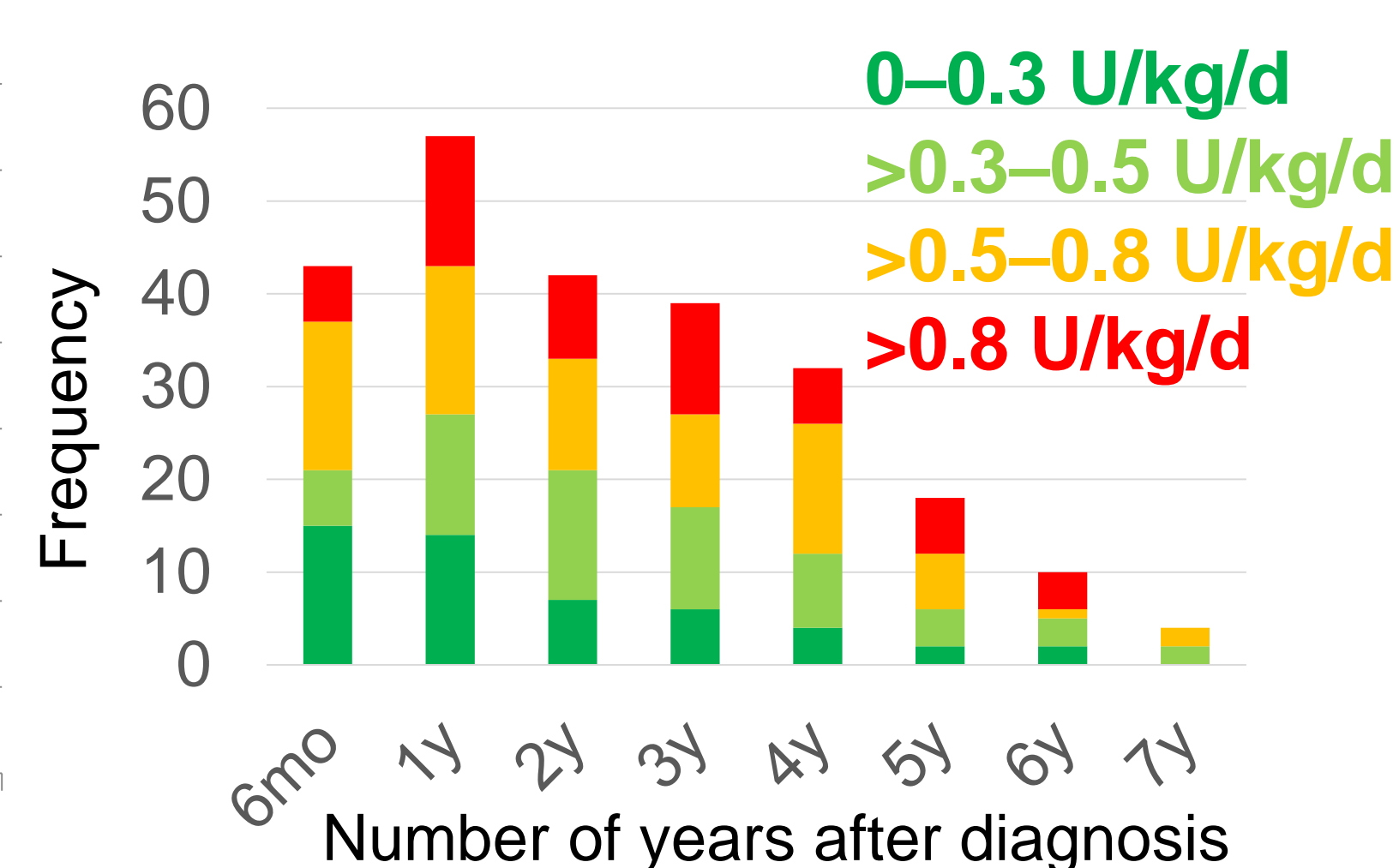


Figure 2: Total daily dose of insulin



Higher doses are predicted by longer diabetes duration ($p < 0.001$), younger age ($p = 0.005$), female sex ($p = 0.003$) and higher A1c ($p = 0.02$).

Results (continued)

Figure 3: Mean A1c distribution over time

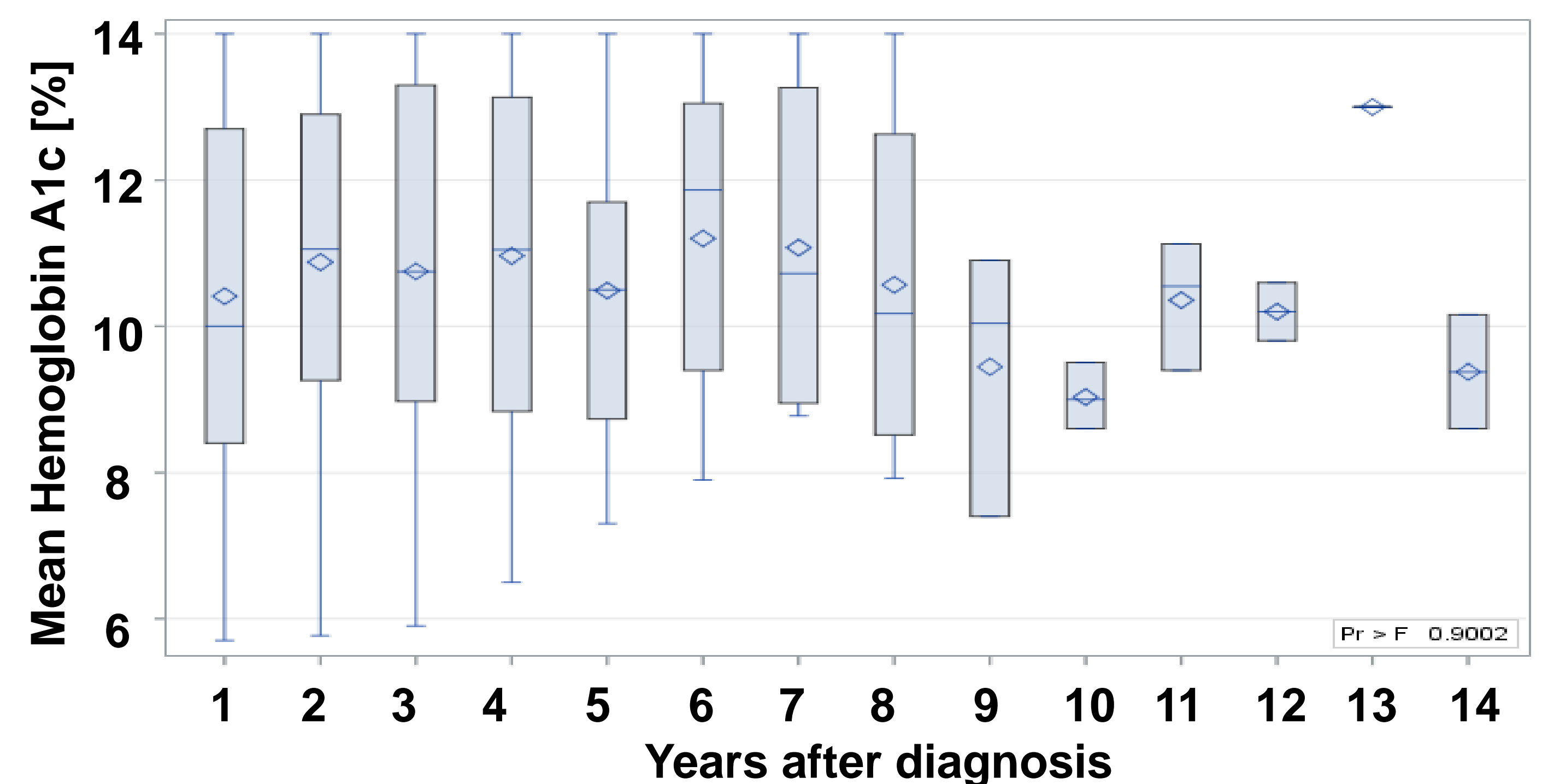


Table 2: Hypertension

Hypertension	N (%)
None	44 (49%)
Hypertension (95%ile)	23 (26%)
Hypertension (99%ile)	23 (26%)

Figure 4: Number of Complications

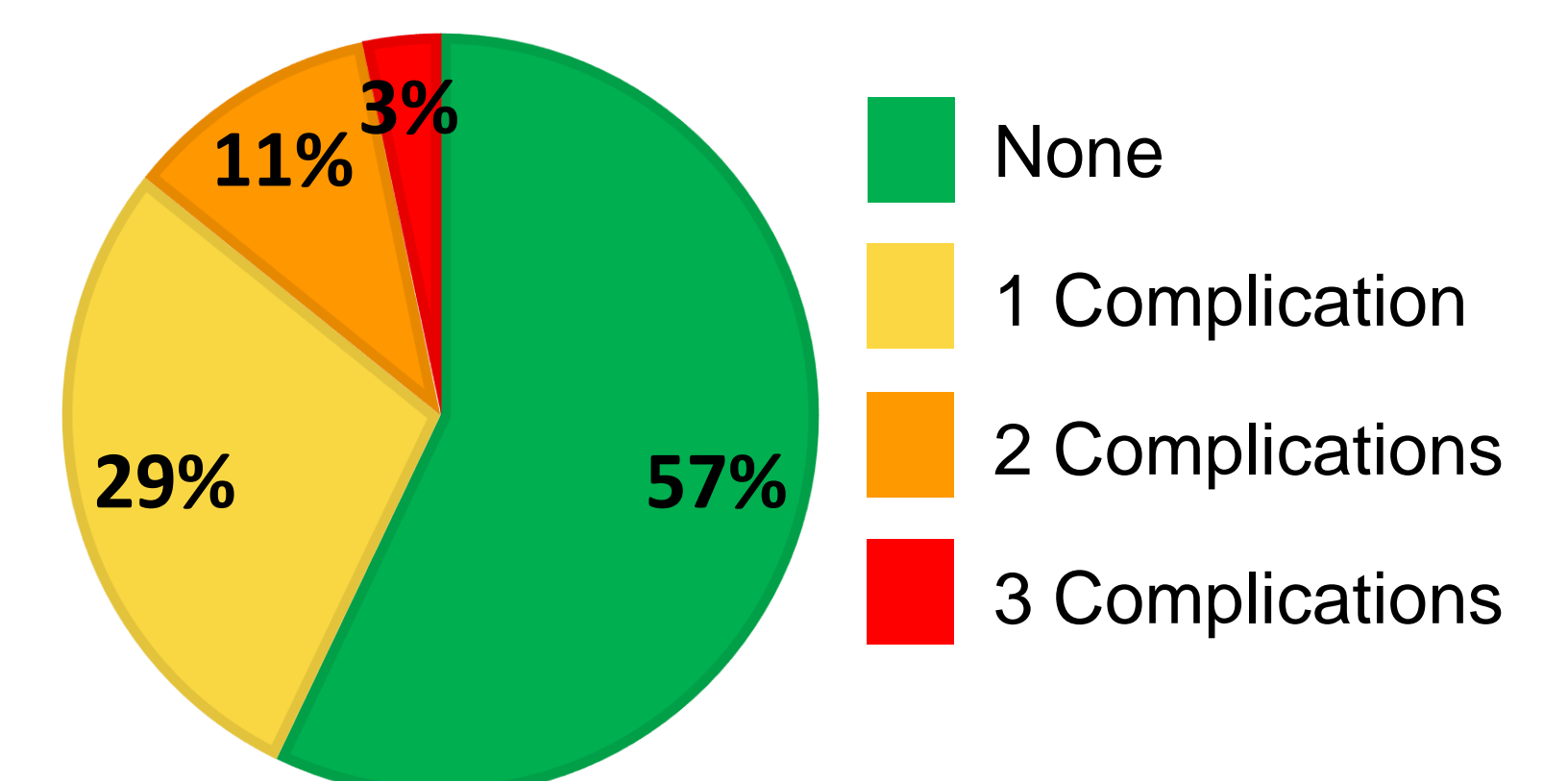


Table 3: Chronic Complications

Complication	N (%)	Age at diagnosis of complication [y] Mean (SD)	Duration of diabetes at complication [y] Median (IQR)
Retinopathy	15 (17.4%)	17.6 (16.1, 19.7)	3.06 (1.7, 4.4)
Cataract	13 (15.3%)	16 (13.6, 18.9)	3.13 (1.6, 4.4)
Nephropathy	18 (24.3%)	18.2 (16.7, 22.6)	3.3 (2.0, 7.7)
Microalbuminuria	5 (20.3%)		
Macroalbuminuria	3 (4.1%)		
Neuropathy	9 (13.6%)	16.3 (15.8, 21.9)	2.8 (0.9, 5.8)
By Microfilament	9 (13.6%)		
By Vibration Testing	1 (1.4%)		

Table 4: Predictors of the presence of any chronic complication

Predictor	Odds Ratio	95% Confidence Limits	P-value
Diabetes Duration	1.81	1.26 – 2.58	0.001
Initial BMI Z-score	0.64	0.41 – 0.99	<0.05
DKA at diagnosis	3.71	1.13 – 12.24	0.03
Most recent Total Daily Insulin Dose (TDD)	1.02	0.81 – 1.28	0.88

Confounders: TDD is a confounder for diabetes duration and BMI z-score

Non-significant predictors: Mean A1c, hypertension, age at diagnosis, sex

Conclusions

- Haitian youth with diabetes are **older at diagnosis**, present to care **late**, and often experience **DKA and coma** at diagnosis.
- **Glycemic control is suboptimal**, despite access to care.
- Diabetes **complications occur frequently and precociously**, are not predicted by mean A1c, and only partly by diabetes duration.
- Prolonged symptoms and extreme cachexia prior to diagnosis, and long periods of low insulin requirements post diagnosis may suggest **prolonged exposure to hyperglycemia prior to diagnosis**, predisposing to early complications.

Future directions

- Evaluation of the nutritional, psychosocial, and socioeconomic determinants of glycemic control, complications and quality of life.
- Validation of findings in prospective cohort study.

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