Supplementary Online Content

Dupas B, Minvielle W, Bonnin S, et al. Association between vessel density and visual acuity in patients with diabetic retinopathy and poorly controlled type 1 diabetes. *JAMA Ophthalmol*. Published online May 10, 2018. doi:10.1001/jamaophthalmol.2018.1319

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Baseline Characteristics of Patients

Patients	**Controls**	**DR Normal VA**	**DR decreased VA**	***P***
No. of patients/eyes	12/12	13/13	9/9	-
Men/total, n	5/7	7/13	4/9	0.5
Age, median [range], years	31 [23-40]	31 [21-40]	28 [21-40]	0.21
Duration of diabetes, median [range], years	-	15,5 [2-27]	16,4 [11-22]	0.98
HbA1c %, median, [range]	-	9 [6.7-12]	8.8 [6,7-10]	0.83
VA median [range], LogMAR, Snellen Eq	0	0 20/20	0.12 [0.1-0.2] 20/25 [20/25-20/32]	<0.0001
PRP (%)	-	13 (100)	9 (100)	-
DR stage where PRP was performed : Severe NPDR PDR	-	 4 9	 2 7	-
Previous anti-VEGF IVI for PDR, n (%)	-	2 (15,4)	4 (44,4)	0.18
CSFT, mean [range], µm	254 [224 – 268]	269 [214-312]	263 [231 - 289]	0.55
ILM-IPL thickness, mean [range], µm	110 [100 – 123]	112 [79-132]	119 [98-153]	0.57
IPL-RPE thickness, mean [range], µm	145 [117-162]	158 [116-203]	145 [98-182]	0.46

DR : diabetic retinopathy; VA = visual acuity; PRP = panretinal photocoagulation; IVI = intravitreal injection; CSFT = central subfield thickness; ILM = internal limiting membrane; IPL = inner plexiform layer; RPE = retinal pigment epithelium; NPDR : non proliferative diabetic retinopathy; PDR : proliferative diabetic retinopathy

eTable 2. ANOVA Model for Foveal Avascular Zone (FAZ) Area in the Control and Diabetes Groups

	Control Normal VA N=12	**Diabetic Normal VA N=13**	**Diabetic Decreased VA N=9**
FAZ area (mm²) = Group of patients (Control Normal VA / Diabetic Normal VA / Diabetic Decreased VA) Group of patients effect, p = **0.0003**			
Adjusted means			
LSMeans (SE)	0.194 (0.036)	0.302 (0.035)	0.447 (0.042)
[LSM 95% CI]	[0.120; 0.268]	[0.231; 0.374]	[0.362; 0.533]
Adjusted means: Difference Control Normal VA vs Diabetic Normal VA			
LSMeans (SE)		0.109 (0.050)	
[LSM 95% CI]		[0.006; 0.211]	
Contrast, p =		**0.0387**	
Adjusted means: Difference Diabetic Normal VA vs Diabetic Decreased VA			
LSMeans (SE)			0.145 (0.054)
[LSM 95% CI]			[0.034; 0.256]
Contrast, p =			**0.0124**

VA = visual acuity; FAZ : foveal avascular zone

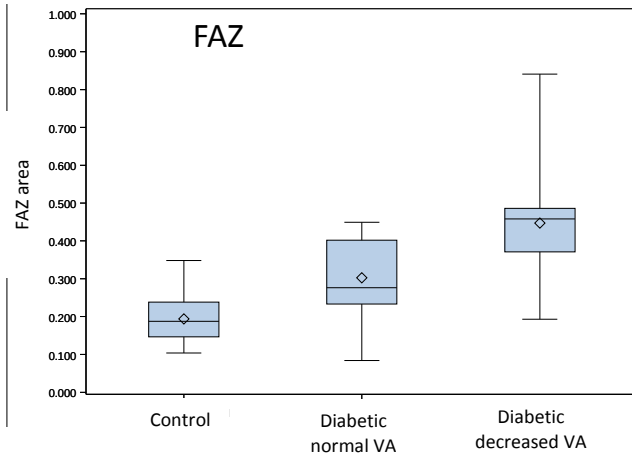
eTable 3. ANOVA Model for Vessel Density (VD) in SVP, ICP, DCP, and DCC in the Control and Diabetes Groups

	Control Normal VA N=12	**Diabetic Normal VA N=13**	**Diabetic Decreased VA N=9**
VD in SVP = Group of patients (Control Normal VA / Diabetic Normal VA / Diabetic Decreased VA) : Group of patients effect , p = **<.0001**			
Adjusted means			
LSMeans (SE)	49.1 (0.9)	44.1 (0.9)	39.6 (1.1)
[LSM 95% CI]	[47.2; 51.0]	[42.3; 45.9]	[37.5; 41.8]
Adjusted means: Difference Control Normal VA vs Diabetic Normal VA			
LSMeans (SE)		-5.0 (1.3)	
[LSM 95% CI]		[-7.5; -2.4]	
Contrast, p =		**0.0004**	
Adjusted means: Difference Diabetic Normal VA vs Diabetic Decreased VA			
LSMeans (SE)			-4.5 (1.4)
[LSM 95% CI]			[-7.3; -1.7]
Contrast, p =			**0.0025**

VD in ICP = Group of patients (Control Normal VA / Diabetic Normal VA / Diabetic Decreased VA) : Group of patients effect , p = **<.0001**			
Adjusted means			
VD in DCP = Group of patients (Control Normal VA / Diabetic Normal VA / Diabetic Decreased VA) : Group of patients effect , p = **<.0001**			
Adjusted means			
LSMeans (SE)	30.5 (1.0)	24.5 (1.0)	15.2 (1.2)
[LSM 95% CI]	[28.4; 32.6]	[22.5; 26.5]	[12.8; 17.6]
Adjusted means: Difference Control Normal VA vs Diabetic Normal VA			
LSMeans (SE)		-6.1 (1.4)	
[LSM 95% CI]		[-8.9; -3.2]	
Contrast, p =		**0.0002**	
Adjusted means: Difference Diabetic Normal VA vs Diabetic Decreased VA			
LSMeans (SE)			-9.3 (1.5)
[LSM 95% CI]			[-12.4; -6.1]
Contrast, p =			**<.0001**
VD in DCC = Group of patients (Control Normal VA / Diabetic Normal VA / Diabetic Decreased VA) : Group of patients effect , p = **<.0001**			
Adjusted means			
LSMeans (SE)	50.6 (1.3)	44.3 (1.2)	34.6 (1.5)
[LSM 95% CI]	[48.0; 53.2]	[41.7; 46.8]	[31.6; 37.7]
Adjusted means: Difference Control Normal VA vs Diabetic Normal VA			
LSMeans (SE)		-6.3 (1.8)	
[LSM 95% CI]		[-9.9; -2.7]	
Contrast, p =		**0.0013**	
Adjusted means: Difference Diabetic Normal VA vs Diabetic Decreased VA			
LSMeans (SE)			-9.6 (1.9)
[LSM 95% CI]			[-13.6; -5.7]
Contrast, p =			**<.0001**

A : visual acuity; VD : vessel density; SVP: superficial vascular plexus; DCC : deep capillary complex; ICP : intermediate capillary complex; DCP : deep capillary plexus

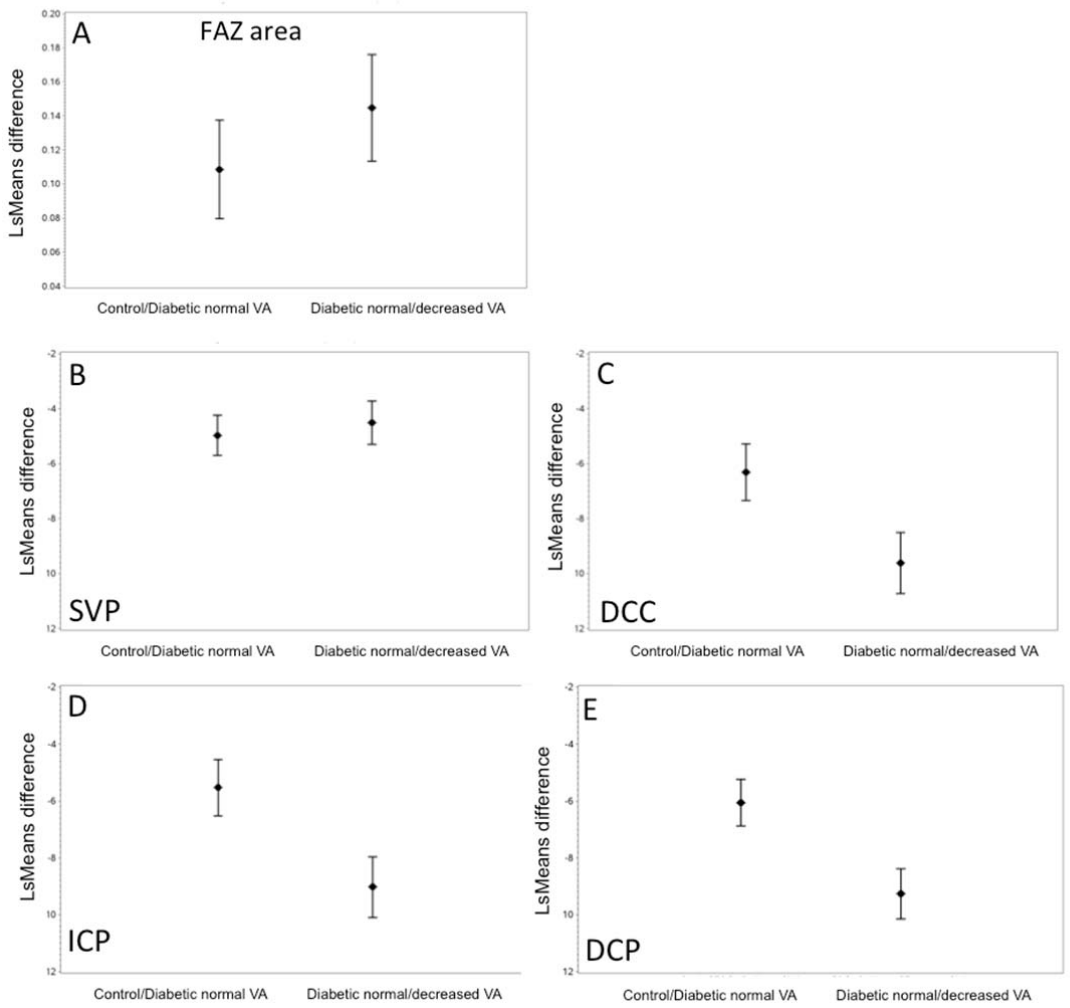
eFigure 1. Adjusted Difference Means for Foveal Avascular Zone (FAZ) Area



FAZ : foveal avascular zone

The ANOVA shows that diabetic patients with a decreased VA have a greater FAZ area compared to diabetic patients with a normal VA. However, the confidence intervals largely overlap, making this parameter less relevant than VD to explain VA.

eFigure 2. Adjusted Difference Means for Foveal Avascular Zone (FAZ) Area and for Vessel Density (VD) in the SVP, DCC, ICP, and DCP



FAZ : foveal avascular zone
SVP : superficial vascular plexus
DCC : deep capillary complex
ICP : intermediate capillary plexus
DCP : deep capillary plexus

Diabetic patients with a decreased VA have a greater mean VD decrease (compared with diabetic patients with normal VA) in the deep plexuses (deep capillary complex [C], intermediate capillary plexus [D] and deep capillary plexus [E]), than in the superficial vascular plexus [B].

eFigure 3. Angiograms of Plexuses in the Eyes of the Control and Diabetes Groups With Normal or Decreased Visual Acuity (VA)

Capillary dropouts are present in all diabetic eyes compared to controls, and more pronounced in eyes with a decreased visual acuity than in eyes with a normal visual acuity. The decrease is more pronounced in the deep capillary plexus (DCP) than in the superficial vascular plexus (SVP).