

Supplementary Table S1. Primers and PCR conditions used in the study.

Type	Target	Sequence	Reference	PCR type	Annealing
F	16s rRNA	CGT GCC AGC AGC CGC GGT AAT ACG	Garcia et al., 1998 (1)	mPCR	70°C
R	PI	TCC GCA TAC GTT GCG TGC ACT CAA G			
R	PG	TAC ATA GAA GCC CCG AAG GAA GAC G			
R	AG	CTT TGC ACA TCA GCG TCA GTA CAT CCC CAA GG			
F	TD	GCA AGA CTT GTA GCG GTA GT	Pardo et al., 2021 (2)	mPCR	60°C
R	TD	GAT GCC TAT TTG CGG GCT TG			
F	TF	CGG TGG TCT CCA ATC TCA CC			
R	TF	GCC CTC AAC ACA CGA CAC TT			
F	AN	GGA ATG ATG GCG TGA ATG GC			
R	AN	CCG ATC CCG TGA GTA CAT GG			
F	AC	GGC KTG CGG TGG GTA CGGG C	Xia et al., 2003 (3)	sPCR	60°C
R	AC	GGC TTT AAG GGA TTC GCT CCR CCT CAC			
F	VE	GTA ACA AAG GTG TCG TTT CTC G	Mashima et al., 2016 (4)	sPCR	60°C
R	VE	GCA CCR TCA AAT ACA GGT GTA GC			
F	SM	GGCACCACAACATTGGGAAGCTCAGTT	Nakano et al., 2006 (5)	sPCR	70°C
R	SM	GGAATGGCCGCTAAGTCAACAGGAT			
F	LC	TGGAAACAGRTGCTAATACCG	Byun et al., 2004 (6)	sPCR	62°C
R	LC	GTCCATTGTGGAAGATTCCC			

Abbreviations: F = forward primer; R = reverse primer; mPCR = multiple PCR; sPCR = single PCR; PG = *P. gingivalis*; PI = *P. intermedia*; AG = *A. actinomycetemcomitans*; AN = *A. naeslundii*; TF = *T. forsythia*; TD = *T. denticola*; AC = *Actinomyces* spp.; VE = *Veillonella* spp.; SM = *S. mutans*, LC = *Lactobacillus* spp.

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3. Xia T, Baumgartner JC. Occurrence of *Actinomyces* in Infections of Endodontic Origin. J. Endod. 2003, 29, 549–552, doi:10.1097/00004770-200309000-00001.
4. Mashima I, Theodorea CF, Thaweboon B, Thaweboon S, Nakazawa F. Identification of *Veillonella* species in the tongue biofilm by using a novel one-step polymerase chain reaction method. PLoS One 2016;11(06):e0157516
5. Nakano K, Inaba H, Nomura R, Nemoto H, Takeda M, Yoshioka H, Matsue H, Takahashi T, Taniguchi K, Amano A, et al. Detection of cariogenic *Streptococcus mutans* in extirpated heart valve and atheromatous plaque specimens. J. Clin. Microbiol. 2006, 44, 3313–3317, doi:10.1128/JCM.00377-06.
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Supplementary Table S2. Main clinical, biochemical and microbial characteristic of children and adolescents with type 1 diabetes according to glucose management indicator (GMI, cut-off=7.5%)

		All (n=83)	GMI≤7.5% (n=50)	GMI>7.5% (n=33)	p value
Gender	Female (%)	33 (39.8)	21 (42.0)	12 (36.4)	0.608
	Male (%)	50 (60.2)	29 (58.0)	21 (63.6)	
Age (years)		12.49±2.18	12.56±2.13	12.37±2.27	0.645
Diabetes duration (years)		6.05±2.88	6.13±2.80	5.92±3.04	0.659
BMI (kg/m ²)		20.08±2.97	19.89±2.65	20.37±3.43	0.506
Total Insulin (U/kg/die)		0.87±0.25	0.87±0.23	0.87±0.28	0.823
Basal Insulin (U/kg/die)		0.43±0.15	0.44±0.16	0.42±0.14	0.915
Prandial Insulin (U/kg/die)		0.40 [0.29-0.55]	0.38 [0.28-0.56]	0.41 [0.34-0.55]	0.539
Mean glycemia (sensor)		171.5±30.4	153.0±15.1	199.3±26.1	>0.001
Blood agar, n=82 (CFU × 10 ⁸ /mL)		10.9±45.5	6.57±5.14	17.9±73.6	0.132
Sabouraud agar, n=81 (CFU × 10 ⁴ /mL)		0.38±1.65	0.31±1.48	0.49±1.90	0.548
Mannitol Salt agar, n=82 (CFU × 10 ⁸ /mL)		0.12±0.92	0.17±1.15	0.04±0.19	0.041
Mitis Salivarius agar, n=82 (CFU × 10 ⁷ /mL)		10.3±22.1	10.2±24.0	10.4±18.9	0.474
MSB, n=82 (CFU × 10 ⁸ /mL)		0.13±0.33	0.13±0.32	0.13±0.36	0.392
<i>Veillonella</i> spp, n(%)		77 (92.8)	46 (92.0)	31 (93.9)	0.738
<i>Actinomyces</i> spp, n(%)		83 (100)	50 (100)	33 (100)	1
<i>Actinomyces naeslundii</i> , n(%)		39 (47)	24 (48.0)	15 (45.5)	0.820
<i>Treponema denticola</i> , n(%)		30 (36)	19 (38.0)	11 (33.3)	0.665
<i>A. actinomycetemcomitans</i> , n(%)		83 (100)	50 (100)	33 (100)	1
<i>Prevotella intermedia</i> , n(%)		83 (100)	50 (100)	33 (100)	1
<i>Porphyromonas gingivalis</i> , n(%)		6 (7.3)	3 (6.0)	3 (9.0)	0.595
<i>Tannerella forsythia</i> , n(%)		27 (32.5)	13 (26.0)	14 (42.4)	0.118
<i>Streptococcus mutans</i> , n(%)		39 (47)	22 (44.0)	17 (51.5)	0.052
<i>Lactobacillus</i> spp, n(%)		83 (100)	50 (100)	33 (100)	1
<i>Veillonella</i> spp + <i>Streptococcus mutans</i> , n(%)		37 (44.6)	21 (42.0)	16 (48.5)	0.056
<i>T. forsythia</i> + <i>T. denticola</i> + <i>P. gingivalis</i> (at least 2 of them), n(%)		14 (16.9)	6 (12.0)	8 (24.2)	0.124

Sample size, n=83, unless otherwise indicated. Data are expressed as means ± SD, medians and interquartile range [IQR] or proportions. Differences between the two groups of individuals were tested by the unpaired Student's t-test for normally distributed variables, the Mann–Whitney U-test for non-normally distributed variables or the chi-squared test for categorical variables, respectively. *Abbreviations*: BMI, Body Mass Index; CFU, Colony Forming Unit; MSB, Mitis Salivarius sucrose Bacitracin.

Supplementary Table S3. Main clinical, biochemical and microbial characteristic of children and adolescents with type 1 diabetes according to percentage of time in target range (TIR, cut-off=70%)

		All (n=87)	TIR≥70% (n=22)	TIR<70% (n=65)	p value
Gender	Female (%)	33 (37.9)	9 (40.9)	24 (36.9)	0.739
	Male (%)	54 (62.1)	13 (59.1)	41 (63.1)	
Age (years)		12.54±2.17	12.87±2.25	12.43±2.15	0.414
Diabetes duration (years)		6.13±2.92	6.45±2.84	6.02±2.96	0.558
BMI (kg/m ²)		20.08±2.97	19.32±2.10	20.33±3.18	0.169
Total Insulin (U/kg/die)		0.88±0.25	0.89±0.27	0.88±0.24	0.848
Basal Insulin (U/kg/die)		0.43±0.15	0.47±0.17	0.42±0.14	0.185
Prandial Insulin (U/kg/die)		0.40 [0.29-0.56]	0.35 [0.28-0.51]	0.41 [0.32-0.56]	0.539
Mean glycemia (sensor)		172.1±30.0	142.1±10.7	182.7±27.2	<0.001
Blood agar, n=82 (CFU × 10 ⁸ /mL)		10.5±44.4	7.36±5.42	11.6±51.6	0.709
Sabouraud agar, n=81 (CFU × 10 ⁴ /mL)		0.36±1.61	0.57±2.29	0.30±1.34	0.520
Mannitol Salt agar, n=82 (CFU × 10 ⁸ /mL)		0.11±0.90	0.001±0.02	0.15±1.05	0.509
Mitis Salivarius agar, n=82 (CFU × 10 ⁷ /mL)		10.1±21.6	14.9±35.3	8.38±14.1	0.226
MSB, n=82 (CFU × 10 ⁸ /mL)		0.18±0.34	0.18±0.34	0.13±0.33	0.574
<i>Veillonella</i> spp, n(%)		81 (93.1)	19 (86.4)	62 (95.4)	0.149
<i>Actinomyces</i> spp, n(%)		87 (100)	22 (100)	65 (100)	1
<i>Actinomyces naeslundii</i> , n(%)		41 (47.1)	10 (45.5)	31 (47.7)	0.856
<i>Treponema denticola</i> , n(%)		32 (36.8)	11 (50.0)	21 (32.3)	0.137
<i>A. actinomycetemcomitans</i> , n(%)		87 (100)	22 (100)	65 (100)	1
<i>Prevotella intermedia</i> , n(%)		87 (100)	22 (100)	65 (100)	1
<i>Porphyromonas gingivalis</i> , n(%)		6 (6.9)	3 (13.6)	3 (4.6)	0.149
<i>Tannerella forsythia</i> , n(%)		29 (33.3)	7 (31.8)	22 (33.8)	0.862
<i>Streptococcus mutans</i> , n(%)		43 (49.4)	6 (27.3)	37 (56.9)	0.016
<i>Lactobacillus</i> spp, n(%)		87 (100)	22 (100)	65 (100)	1
<i>Veillonella</i> spp+ <i>Streptococcus mutans</i> ., n(%)		41 (47.13)	5 (22.7)	36 (55.4)	0.008
<i>T. forsythia</i> + <i>T. denticola</i> + <i>P. gingivalis</i> (at least 2 of them), n(%)		16 (18.4)	5 (22.7)	11 (16.9)	0.375

Sample size, n=87, unless otherwise indicated. Data are expressed as means ± SD, medians and interquartile range [IQR] or proportions. Differences between the two groups of individuals were tested by the unpaired Student's t-test for normally distributed variables, the Mann–Whitney U-test for non-normally distributed variables or the chi-squared test for categorical variables, respectively. *Abbreviations*: BMI, Body Mass Index; CFU, Colony Forming Unit; MSB, Mitis Salivarius sucrose Bacitracin.

Supplementary Table S4. Main clinical, biochemical and microbial characteristic of children and adolescents with type 1 diabetes according to percentage of time above range (TAR, cut-off=25%)

		All (n=87)	TAR<25% (n=19)	TAR>25% (n=68)	p value
Gender	Female (%)	33 (37.9)	6 (31.6)	27 (39.7)	0.519
	Male (%)	54 (62.1)	13 (68.4)	41 (60.3)	
Age (years)		12.54±2.17	13.06±2.33	12.39±2.12	0.233
Diabetes duration (years)		6.13±2.92	6.22±2.85	6.11±2.96	0.881
BMI (kg/m ²)		20.08±2.97	19.09±2.11	20.35±3.12	0.100
Total Insulin (U/kg/die)		0.88±0.25	0.87±0.28	0.88±0.24	0.902
Basal Insulin (U/kg/die)		0.43±0.15	0.45±0.18	0.42±0.14	0.508
Prandial Insulin (U/kg/die)		0.40 [0.29-0.56]	0.36 [0.27-0.50]	0.41 [0.32; 0.57]	0.377
Mean glycemia (sensor)		172.1±30.0	139.9±9.76	181.5±27.2	<0.001
Blood agar, n=82 (CFU × 10 ⁸ /mL)		10.5±44.4	7.00±5.80	11.5±50.4	0.707
Sabouraud agar, n=81 (CFU × 10 ⁴ /mL)		0.36±1.61	0.05±0.15	0.44±1.79	0.391
Mannitol Salt agar, n=82 (CFU × 10 ⁸ /mL)		0.11±0.90	0.007±0.02	0.14±1.02	0.552
Mitis Salivarius agar, n=82 (CFU × 10 ⁷ /mL)		10.1±21.6	15.9±38.0	8.39±13.8	0.186
MSB, n=82 (CFU × 10 ⁸ /mL)		0.18±0.34	0.17±0.36	0.13±0.32	0.674
<i>Veillonella</i> spp, n(%)		81 (93.1)	17 (89.5)	64 (94.1)	0.480
<i>Actinomyces</i> spp, n(%)		87 (100)	19 (100)	68 (100)	1
<i>Actinomyces naeslundii</i> , n(%)		41 (47.1)	7 (36.8)	34 (50.0)	0.310
<i>Treponema denticola</i> , n(%)		32 (36.8)	9 (47.4)	23 (33.8)	0.279
<i>A. actinomycetemcomitans</i> , n(%)		87 (100)	19 (100)	68 (100)	1
<i>Prevotella intermedia</i> , n(%)		87 (100)	19 (100)	68 (100)	1
<i>Porphyromonas gingivalis</i> , n(%)		6 (6.9)	3 (15.8)	3 (4.4)	0.084
<i>Tannerella forsythia</i> , n(%)		29 (33.3)	7 (36.8)	22 (32.4)	0.714
<i>Streptococcus mutans</i> , n(%)		43 (49.4)	5 (26.4)	38 (55.9)	0.023
<i>Lactobacillus</i> spp, n(%)		87 (100)	22 (100)	65 (100)	1
<i>Veillonella</i> spp+ <i>Streptococcus mutans</i> , n(%)		41 (47.1)	4 (21.0)	37 (54.4)	0.010
<i>T. forsythia</i> + <i>T. denticola</i> + <i>P. gingivalis</i> (at least 2 of them), n(%)		16 (18.4)	5 (26.3)	11 (16.2)	0.244

Sample size, n=87, unless otherwise indicated. Data are expressed as means ± SD, medians and interquartile range [IQR] or proportions. Differences between the two groups of individuals were tested by the unpaired Student's t-test for normally distributed variables, the Mann-Whitney U-test for non-normally distributed variables or the chi-squared test for categorical variables, respectively. *Abbreviations*: BMI, Body Mass Index; CFU, Colony Forming Unit; MSB, Mitis Salivarius sucrose Bacitracin.