

**Table S1** Parameters comparing participants with and without varicocele

Variables	Total (n=875)	Without varicocele (n=604)	With varicocele (n=271)	P value
Semen group				<0.001
I	260 (29.714)	200 (33.113)	60 (22.140)	
II	405 (46.286)	265 (43.874)	140 (51.661)	
III	102 (11.657)	53 (8.775)	49 (18.081)	
IV	108 (12.343)	86 (14.238)	22 (8.118)	
Age (years)	33.000 [30.000, 36.000]	33.000 [30.000, 36.000]	34.000 [31.000, 37.000]	0.017
BMI (kg/m <sup>2</sup> )	26.100 [23.400, 28.300]	26.300 [23.900, 28.400]	25.200 [22.800, 28.000]	0.002
UMVD-R (per cm <sup>2</sup> )	24.000 [20.000, 29.000]	24.000 [20.000, 29.000]	24.000 [20.000, 29.000]	0.606
UMVD-L (per cm <sup>2</sup> )	25.000 [20.000, 29.000]	25.000 [20.000, 29.000]	26.000 [21.000, 29.000]	0.304
UMVD-mean (per cm <sup>2</sup> )	24.576±6.646	24.431±6.603	24.899±6.730	0.337
Sperm concentration (10 <sup>6</sup> per mL)	37.900 [16.860, 65.490]	39.660 [18.240, 68.410]	32.900 [12.210, 57.900]	0.067
Total sperm number (10 <sup>6</sup> per ejaculate)	126.200 [52.260, 227.360]	132.480 [58.390, 232.080]	116.830 [40.960, 211.200]	0.316
Total motility (PR + NP, %)	27.880 [12.100, 41.250]	29.130 [12.500, 43.130]	25.000 [10.720, 33.820]	0.001
Progressive motility (PR, %)	34.740 [15.460, 49.360]	36.620 [15.900, 53.020]	30.720 [15.240, 43.860]	0.003
UVE-L (mL)	13.290 [10.980, 15.880]	13.240 [11.010, 16.030]	13.420 [10.970, 15.620]	0.952
UVE-R (mL)	13.720 [11.010, 16.280]	13.660 [10.740, 16.300]	13.850 [11.470, 16.120]	0.302
UVE-mean (mL)	13.545 [11.035, 15.935]	13.515 [10.945, 15.935]	13.715 [11.250, 15.840]	0.491

Data are represented as median [IQR] or number (%). Group I, participants with normozoospermia; Group II, participants with asthenozoospermia, teratozoospermia, or asthenoteratozoospermia; Group III, participants with oligozoospermia; Group IV, participants with non-obstructive azoospermia. BMI, body mass index; UMVD-R, ultrasonic microvascular density of the right testis; UMVD-L, ultrasonic microvascular density of the left testis; UMVD-mean, the mean ultrasonic microvascular density of bilateral testes; PR, progressive motility; NP, non-progressive motility; UVE-R, testicular ultrasonographic volume estimation of the right testis; UVE-L, testicular ultrasonographic volume estimation of the left testis; UVE-mean, the mean testicular ultrasonographic volume estimation of bilateral testes; IQR, interquartile range.

**Table S2** Parameters comparing participants with varicocele grades of varying severity

Variables	Total (n=875)	Without varicocele (n=604)	Varicocele grade			P value
			Grade 1 (n=151)	Grade 2 (n=71)	Grade 3 (n=49)	
<b>Semen group</b>						
Group I	260 (29.714)	200 (33.113)	36 (23.841)	14 (19.718)	10 (20.408)	<0.001
Group II	405 (46.286)	265 (43.874)	73 (48.344)	39 (54.930)	28 (57.143)	
Group III	102 (11.657)	53 (8.775)	32 (21.192)	10 (14.085)	7 (14.286)	
Group IV	108 (12.343)	86 (14.238)	10 (6.623)	8 (11.268)	4 (8.163)	
Age (years)	33.000 [30.000, 36.000]	33.000 [30.000, 36.000]	33.000 [31.000, 36.000]	35.000 [32.000, 39.000]	34.000 [31.000, 37.000]	0.017
BMI (kg/m <sup>2</sup> )	26.100 [23.400, 28.300]	26.300 [23.900, 28.400]	25.400 [23.100, 27.600]	24.000 [22.400, 28.300]	24.600 [22.500, 29.000]	0.014
UMVD-R (per cm <sup>2</sup> )	24.000 [20.000, 29.000]	24.000 [20.000, 29.000]	24.000 [20.000, 28.000]	24.000 [19.000, 28.000]	26.000 [19.000, 30.000]	0.822
UMVD-L (per cm <sup>2</sup> )	25.000 [20.000, 29.000]	25.000 [20.000, 29.000]	26.000 [21.000, 30.000]	24.000 [19.000, 29.000]	26.000 [22.000, 29.000]	0.485
UMVD-mean (per cm <sup>2</sup> )	24.500 [20.500, 29.000]	24.500 [20.500, 29.000]	25.000 [21.000, 29.000]	24.000 [20.500, 28.000]	26.000 [20.000, 29.000]	0.654
Sperm concentration (10 <sup>6</sup> per mL)	37.900 [16.860, 65.490]	39.660 [18.240, 68.410]	34.810 [11.100, 59.020]	32.040 [16.090, 53.900]	32.900 [16.860, 51.560]	0.266
Total sperm number (10 <sup>6</sup> per ejaculate)	126.200 [52.260, 227.360]	132.480 [58.390, 232.080]	116.790 [37.480, 202.260]	117.520 [48.270, 211.200]	119.170 [62.740, 236.540]	0.763
Total motility (PR + NP, %)	27.880 [12.100, 41.250]	29.130 [12.500, 43.130]	26.720 [10.160, 33.650]	21.170 [10.940, 33.930]	25.000 [14.090, 33.340]	0.014
Progressive motility (PR, %)	34.740 [15.460, 49.360]	36.620 [15.900, 53.020]	33.010 [14.710, 43.590]	27.230 [15.570, 43.940]	30.720 [18.560, 44.600]	0.025
UVE-L (mL)	13.290 [10.980, 15.880]	13.240 [11.010, 16.030]	13.060 [11.040, 15.080]	13.830 [10.970, 15.840]	13.030 [10.880, 17.300]	0.571
UVE-R (mL)	13.720 [11.010, 16.280]	13.660 [10.740, 16.300]	13.490 [11.300, 15.890]	14.200 [12.350, 16.430]	14.030 [11.470, 17.490]	0.278
UVE-mean (mL)	13.545 [11.035, 15.935]	13.515 [10.945, 15.935]	13.210 [11.125, 15.505]	14.185 [11.820, 16.505]	13.850 [11.495, 17.445]	0.364

Data are represented as median [IQR] or number (%). Group I, participants with normozoospermia; Group II, participants with asthenozoospermia, teratozoospermia, or asthenoteratozoospermia; Group III, participants with oligozoospermia; Group IV, participants with non-obstructive azoospermia. BMI, body mass index; UMVD-R, ultrasonic microvascular density of the right testis; UMVD-L, ultrasonic microvascular density of the left testis; UMVD-mean, the mean ultrasonic microvascular density of bilateral testes; PR, progressive motility; NP, non-progressive motility; UVE-R, testicular ultrasonographic volume estimation of the right testis; UVE-L, testicular ultrasonographic volume estimation of the left testis; UVE-mean, the mean testicular ultrasonographic volume estimation of bilateral testes; IQR, interquartile range.