**Table 1. Baseline standard echocardiographic parameters and diastolic function characteristics in the patient groups**

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| --- | --- | --- | --- |
| **Parameter** | **Group < 50 years of age (n = 39)** | **Group ≥ 50 years of age (n = 30)** | ***P* value** |
| Qp/Qs | 2.74 ± 0.22 | 2.96 ± 0.23 | < 0.001 |
| LA volume, mL (reference range, 18 to 58 mL (M), 22 to 52 mL (F)) | 44.2 ± 11.5 | 48.8 ± 16.4 | 0.202 |
| LA volume index, mL/m2 (reference range, 16–34 mL/m2) | 25.4 ± 7.1 | 27.6 ± 9.8 | 0.311 |
| LV EDD, mm (reference range < 58.4 (M), < 52.2 (F)) | 42.2 ± 4.5 | 40.7 ± 3.5 | 0.376 |
| LV EDV, mL (reference range, 62 to 120 mL (M), 58 to 103 mL (F)) | 74.2 ± 12.4 | 73.2 ± 10.9 | 0.727 |
| LV EDV index, mL/m2  (reference range < 76 mL/m2 (M), < 57 mL/m2 (F)) | 42.4 ± 8.6 | 41.8 ± 7.9 | 0.768 |
| LV EF, % (reference range, 55 to 70%) | 65.1 ± 8.6 | 67.6 ± 8.1 | 0.227 |
| Е, cm/s (reference range < 50 cm/s) | 80.2 ± 18.4 | 73.5 ± 22.5 | 0.196 |
| А, cm/s (reference range, 45 to 70 cm/s) | 51.7 ± 11.4 | 49.5 ± 24.3 | 0.653 |
| Transmitral Е/А (reference range, 1.0 to 1.5) | 1.52 ± 3.4 | 1.44 ± 5.4 | 0.944 |
| DT of transmitral Е, m/s (reference range, 160 to 220 m/s) | 213.5 ± 66.8 | 195.6 ± 47.3 | 0.204 |
| TDI e’ lateral, cm/s (reference range > 10 cm/s) | 11.9 ± 2.5 | 9.3 ± 3.6 | 0.001 |
| Е/e’ mean (reference range < 8) | 7.6 ± 3.6 | 9.2 ± 5.7 | 0.190 |

А, peak velocity of late inflow; DT E, deceleration time; Е, peak velocity of the early inflow; Е/e’, the ratio of early transmitral filling to early diastolic velocity of the mitral annulus; F, female; LA, left atrium; LF EDD, left ventricular end diastolic diameter; LV EDV, left ventricular end diastolic volume; LV EF, left ventricular ejection fraction; M, male; Qp/Qs, the ratio of the volume flow in the pulmonary and systemic circulation; TDI e’ lateral, early diastolic velocity of the lateral mitral fibrous annulus excursion

**Table 2. Comparison of the echocardiographic characteristics of diastolic function in the patient groups before and immediately after the atrial septal defect closure**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Group < 50 years of age (n = 39)** | | |  | **Group ≥ 50 years of age (n = 30)** | | |
| **At baseline** | **After closure** | ***P* value** |  | **At baseline** | **After closure** | ***P* value** |
| Е, cm/s | 80.2 ± 18.4 | 73.7 ± 21.6 | 0.162 |  | 73.5 ± 22.5 | 77.1 ± 23.8 | 0.522 |
| А, cm/s | 51.7 ± 11.4 | 63.4 ± 12.8 | < 0.001 |  | 49.5 ± 24.3 | 70.3 ± 15.1 | < 0.001 |
| Transmitral Е/А | 1.52 ± 3.4 | 1.19 ± 3.8 | 0.291 |  | 1.44 ± 5.4 | 1.12 ± 4.4 | 0.805 |
| DT of the transmitral Е, m/s | 213.5 ± 66.8 | 200.5 ± 48.5 | 0.332 |  | 195.6 ± 47.3 | 176.7 ± 28.6 | 0.070 |
| TDI of the e’ lateral, cm/s | 11.9 ± 2.5 | 9.1 ± 2.2 | < 0.001 |  | 9.3 ± 3.6 | 7.9 ± 1.6 | 0.061 |
| Е/e’, mean | 7.6 ± 3.6 | 9.9 ± 4.1 | 0.012 |  | 9.2 ± 5.7 | 13.1 ± 4.3 | 0.005 |

А, peak velocity of late inflow; DT E, deceleration time; Е, peak velocity of the early inflow; Е/e’, the ratio of early transmitral filling to early diastolic velocity of the mitral annulus; TDI e’ lateral, early diastolic velocity of the lateral mitral fibrous annulus excursion

**Table 3. Comparison of the echocardiographic characteristics of diastolic function in the patient groups immediately after the atrial septal defect closure**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Group < 50 years of age (n = 39)** | **Group ≥ 50 years of age (n = 30)** | ***P* value** |
| Е, cm/s | 73.7 ± 21.6 | 77.1 ± 23.8 | 0.307 |
| А, cm/s | 63.4 ± 12.8 | 70.3 ± 15.1 | 0.023 |
| Transmitral Е/А | 1.19 ± 3.8 | 1.12 ± 4.4 | 0.212 |
| DT of the transmitral Е, m/s | 200.5 ± 48.5 | 176.7 ± 28.6 | 0.007 |
| TDI of the e’ lateral, cm/s | 9.1 ± 2.2 | 7.9 ± 1.6 | 0.014 |
| Е/e’, mean | 9.9 ± 4.1 | 13.1 ± 4.3 | 0.002 |

А, peak velocity of late inflow; DT E, deceleration time; Е, peak velocity of the early inflow; Е/e’, the ratio of early transmitral filling to early diastolic velocity of the mitral annulus; TDI e’ lateral, early diastolic velocity of the lateral mitral fibrous annulus excursion

**Table 4. Comparison of the echocardiographic characteristics of diastolic function in the patient groups before and at long-term after the atrial septal defect closure**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Group < 50 years of age (n = 39)** | | |  | **Group ≥ 50 years of age (n = 30)** | | | ***P* value\*** |
| **At baseline** | **After closure** | ***P* value** |  | **At baseline** | **After closure** | ***P* value** |
| LA volume, mL | 44.2 ± 11.5 | 47.6 ± 14.5 | 0.246 |  | 48.8 ± 16.4 | 51.7 ± 15.3 | 0.489 | 0.260 |
| LA volume index, mL/m2 | 25.4 ± 7.1 | 26.2 ± 7.3 | 0.630 |  | 27.6 ± 9.8 | 29.0 ± 8.5 | 0.563 | 0.108 |
| LV EDD, mm | 41.4 ± 4.5 | 45.2 ± 5.4 | 0.001 |  | 40.7 ± 3.5 | 44.2 ± 4.9 | 0.003 | 0.413 |
| LV EDV, mL | 74.2 ± 12.4 | 95.1 ± 18.5 | < 0.001 |  | 73.2 ± 10.9 | 88.1 ± 16.4 | < 0.001 | 0.048 |
| LV EDV index, ml/m2 | 42.4 ± 8.6 | 54.3 ± 11.8 | < 0.001 |  | 41.8 ± 7.9 | 50.3 ± 7.8 | 0.019 | 0.263 |
| LV EF, % | 65.1 ± 8.6 | 69.6 ± 7.1 | 0.015 |  | 67.6 ± 8.1 | 69.7 ± 7.0 | 0.295 | 0.954 |
| Е, cm/s | 80.2 ± 18.4 | 76.5 ± 19.8 | 0.398 |  | 73.5 ± 22.5 | 75.2 ± 21.6 | 0.762 | 0.796 |
| А, cm/s | 51.7 ± 11.4 | 54.6 ± 12.8 | 0.301 |  | 49.5 ± 24.3 | 59.8 ± 15.1 | 0.057 | 0.127 |
| Transmitral Е/А | 1.52 ± 3.4 | 1.40 ± 4.2 | 0.885 |  | 1.44 ± 5.4 | 1.26 ± 4.8 | 0.890 | 0.225 |
| DT of the transmitral E, m/s | 213.5 ± 66.8 | 207.3 ± 45.1 | 0.636 |  | 195.6 ± 42.3 | 188.7 ± 40.5 | 0.551 | 0.081 |
| TDI of e’ lateral, cm/s | 11.9 ± 2.5 | 11.6 ± 1.9 | 0.558 |  | 9.3 ± 3.6 | 8.9 ± 2.8 | 0.603 | 0.0014 |
| Е/e’, mean | 7.6 ± 3.6 | 8.7 ± 4.8 | 0.262 |  | 9.2 ± 5.7 | 10.8 ± 5.6 | 0.285 | 0.0985 |

А, peak velocity of late inflow; DT E, deceleration time; Е, peak velocity of the early inflow; Е/e’, the ratio of early transmitral filling to early diastolic velocity of the mitral annulus; LA, left atrium; LF EDD, left ventricular end diastolic diameter; LV EDV, left ventricular end diastolic volume; LV EF, left ventricular ejection fraction;  
Qp/Qs, the ratio of the volume flow in the pulmonary and systemic circulation; TDI e’ lateral, early diastolic velocity of the lateral mitral fibrous annulus excursion

\* Comparison between the groups < 50 and ≥ 50 years of age at 12 months