**Impact of wait times for orthologous heart transplant after implantation of left ventricular assist devices (LVAD)**

Background: The optimal timing for orthologous heart transplant (OHT) after the implantation of left ventricular assist devices (LVAD) is unknown. In determining the optimal time for OHT after LVAD, the need for clinical stability and time to recover from major surgery is balanced by the risk of LVAD complications and the formation of adhesions and scarring.

Methods and Results: With the Nationwide Inpatient Sample (NIS) from 1998 to 2011, we identified 2200 patients 18 years of age or greater who underwent implantation of a LVAD and for which day of procedures was available. 164 (7.5%) patients also underwent OHT during the same hospitalization, which occurred 32 days (IQR 7.75 - 66 days) after LVAD implantation. Of patients who underwent OHT, increased in-hospital mortality was identified in patients who underwent transplantation within 7 days of LVAD implantation compared to patients who underwent transplant after 8 days (26.8% vs. 12.2%, p = 0.0483). There was no statistically significant difference in patient demographics with regards to age, sex, race, household income, or number of comorbid diagnoses. Patients who waited longer after LVAD implantation for OHT had longer hospital stays (39.3 ± 33.2 days for the first quartile, 48.87 ± 25.6 days for the second quartile, 85.8 ± 40.1 days for the third quartile, 151.2 ± 52.6 days for the fourth quartile). Compared to patients who underwent LVAD implantation but did not undergo OHT, patients who underwent late OHT after LVAD had decreased mortality (12.2% vs. 27.0% p < 0.001). Patients who underwent early transplant after LVAD did not show a similar mortality benefit (26.8% vs. 27.0%, p = 0.946).

Conclusions: In the Nationwide Inpatient Sample, the rate of in-hospital mortality is decreased for patients who underwent late OHT after LVAD (greater than 8 days from LVAD implantation) compared to patients who did not receive OHT and patients who undergo OHT within 1 week of LVAD implantation.

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| **Table 1.** Baseline demographics for early and late in-hospital Orthostatic Heart Transplant (OHT) after Left Ventricular Assist Device (LVAD) Implantation | | | | | |
|  | OHT 0 - 7 days after LVAD | OHT 8 - 31 days after LVAD | OHT 32 - 65 days after LVAD | OHT 66 days or more after LVAD | p-value (early group vs. pooled other groups) |
| (n = 41) | (n = 38) | (n = 42) | (n = 43) |
| Length of stay (SD) | **39.3 ± 33.2** | **48.87 ± 25.6** | **85.8 ± 40.1** | **151.2 ± 52.6** | **p < 0.001** |
| Mortality (%) | **11 (26.8)** | **5 (13.2)** | **5 (11.9)** | **5 (11.6)** | **p = 0.0483** |
| Age, mean (SD) | 50.6 ± 12.6 | 48.6 ± 12.7 | 47.4 ± 15.3 | 46.3 ± 13.1 | p = 0.1667 |
| Sex, n (%) | | | | | |
| Male | 8 (19.5) | 6 (15.8) | 7 (16.7) | 9 (20.9) | Not statistically significant |
| Female | 33 (80.5) | 32 (84.2) | 35 (83.3) | 34 (79.1) |
|  |  |  |  |  |  |
| Race, n (%) | | | | | |
| White | 25 (61.0) | 19 (50.0) | 23 (54.8) | 22 (51.2) | Not statistically significant |
| Black | 3 (7.3) | 5 (13.2) | 8 (19.0) | 6 (14.0) |
| Hispanic | 3 (7.3) | 7 (18.4) | 2 (4.8) | 5 (11.6) |
| Asian/Pacific Islander | 2 (4.9) | 0 (0.0) | 1 (2.4) | 4 (9.3) |
| Native American | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Other or unknown | 8 (19.5) | 7 (18.4) | 8 (20.0) | 6 (14.0) |
|  |  |  |  |  |  |
| Median household income, n (%) | | | | | |
| $1-24,999 | 4 (9.8) | 8 (21.1) | 8 (19.0) | 8 (18.6) | Not statistically significant |
| $25,000-34,999 | 10 (24.4) | 10 (26.3) | 10 (23.8) | 7 (16.3) |
| $35,000-44,999 | 12 (29.3) | 8 (21.1) | 10 (23.8) | 13 (30.2) |
| $45,000 or more | 12 (29.3) | 12 (31.6) | 14 (33.3) | 14 (32.6) |
| Unknown | 3 (7.3) | 0 (0.0) | 0 (0.0) | 1 (2.3) |
| Number of concomitant diagnosis, mean ± SD | 11.9 ± 3.1 | 12.3 ± 3.0 | 12.5 ± 3.2 | 12.5 ± 3.2 | p = 0.2961 |

