



Interval Depression Screening and Quality of Life Relationships in Ventricular Assist Device Patients



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Abstract

Purpose: Depression prevalence affects 16.1 million Americans and tends to be higher in the Heart Failure (HF) population. However, many HF patients suffering from depression go undiagnosed. The Patient Health Questionnaire-9 (PHQ-9) consists of nine questions and exists as a brief Depression screening tool for health care providers. We examined relationships between PHQ-9 scores and quality of life (QOL) of VAD patients at repeated intervals utilizing the Patient Visual Analog Status (VAS).

Methods: Data was collected on those implanted with a VAD from September 2012 through September 2017, and followed in our center (n=25, 17 males). PHQ-9 questionnaires and EQ5D including VAS scores were completed by participating patients at 1, 3, 6, 9, 12 and every 6 month intervals, from 1 month to 4 years post device implant. Pearson correlation was used to test relationships.

Results: Visual Analog Status data found multiple strong positive relationships between subsequent 1 month, 3 month and 6 month scores (Mean= 70.80 +/-15.83 days, 74.82 +/-13.28 days, and 76.63+/-19.47 days respectively [r=0.97, n=4, p= 0.030 and r=0.86, n=8, p=0.006 respectively]). Positive association was found between the PHQ-9 6 and 9 month responses (Mean=5.20 +/-6.96 and 5.50 +/- 6.09 respectively, r=0.99, n=4, p=0.007). A strong inverse relationship was found with VAS scores at 12 months (Mean=75.63 +/- 19.54) and PHQ-9 scores at 12 months (Mean=5.88 +/- 6.17, r=-0.89, n=8, p=0.003). PHQ-9 and VAS results at 18 months found higher VAS results (reflecting higher QOL) in those that had lower PHQ-9 scores (Mean= 7.17 +/- 7.14 and 78.33 +/- 14.38 respectively, r=-0.84, n=6, p=0.034). Negative association was found with INTERMACS scores prior to implant (Mean 3.12 +/- 1.05, n=25) to the PHQ-9 scores at 3 months (Mean= 2.89 +/- 3.18, r=-0.84, n=9, p=0.003), and a positive relationship to the VAS at 3 years (Mean 1.67, r=1.00, n=3, p=0.036).

Conclusions: Ongoing depression screening is important in the VAD population as many remain undiagnosed. VAS scores, a patient reported overall QOL measure, improved as VAD therapy days increased. VAS scores were also higher when PHQ-9 scores were lower. Further research is needed for better understanding of positive and negative contributors of QOL in VAD patients.

Table 1: Study Demographics

Total (n=25)	
Age (years)	66.92 +/- 8.40
Gender (males)	17 (68%)
INTERMACS Score	3.12 +/-1.05 (n=25)
PHQ-9:	
Baseline	7.64 +/- 3.91, n=11
1 Month	4.60 +/- 1.52, n= 5
3 month	2.89 +/- 3.18, n= 9
6 month	5.20 +/-6.96, n=10
9 Month	5.50 +/- 5.09, n= 6
12 Month	5.88 +/- 6.17, n= 8
18 month	7.17 +/- 7.14, n=6
VAS:	
Baseline	40.26 +/- 18.23, n=19
1 Month	70.80 +/- 15.83, n= 5
3 Month	74.82 +/- 13.28, n=11
6 Month	76.36 +/-19.47, n=11
9 Month	81.17 +/- 13.12, n=6
12 Month	75.63 +/- 19.54, n=8
18 Month	78.33 +/- 14.38, n=6
Patient History:	
COPD	9 (36%)
Tobacco History	19 (76%)
Hypertension	12 (48%)
Cardiorenal Syndrome	18 (72%)
Inotrope Use Before VAD	15 (60%)
Diabetes	11 (44%)
ICM	10 (40%)
NICM	12 (48%)
Mixed CM	3 (12%)
Average Frailty Pre-VAD	7.33 seconds +/- 3.38 (n=19)

	EQ5D (VAS) Scores	PHQ-9 Total Scores	Significance
Baseline	40.26 +/- 18.23 (n=19)	7.64 +/- 3.91 (n=11)	
1 mo	70.80 +/-15.83 (5)	4.60 +/- 1.52 (5)	p=0.847
3 mo	74.82 +/-13.28 (11)	2.89 +/- 3.18 (9)	p=0.060
6 mo	76.36 +/-19.47 (11)	5.20 +/- 6.96 (10)	p=0.319
9 mo	81.17 +/- 13.12 (6)	5.50 +/-6.09 (6)	p=0.077
12 mo	75.63 +/- 19.54 (8)	5.88 +/- 6.17 (8)	p=0.003* (neg)
18 mo	78.33 +/-14.38 (6)	7.17 +/- 7.14 (6)	p=0.034* (neg)
2 yrs	61.25 +/- 16.52 (4)	9.75 +/- 3.59 (4)	p=0.249
2.5 yrs	60.00 +/- 22.91 (3)	8.67 +/- 5.51 (3)	p=0.821
3 yrs	61.67 +/- 44.81 (3)	4.00 +/- 5.29 (3)	p=0.157
3.5 yrs	Mean 95.00 (1)	Mean 0.00 (1)	
4 yrs	Mean 97.00 (1)	Mean 1.00 (1)	

Discussion/Limitations

Discussion:

A multitude of evaluation efforts exist to further assess ongoing quality of life in the Ventricular Assist Device population. A VAD patient's QOL perception can be based on a variety of factors and not only from the degree of heart failure symptoms. Other statistical evaluations were completed, utilizing baseline VAS and PHQ-9 scores. On a scale of 0-100, the average perception based on the VAS values was 40.26 (+/-18.23), while the baseline PHQ-9 score (max score of 27) prior to VAD implant was 7.64 (+/-3.91). A strong negative correlation was found between baseline VAS and overall PHQ-9 scores at one month (r=-0.94, n=5, p=0.017). Baseline PHQ-9 scores were found to also have strong positive correlations with 1 and 3 month PHQ-9 scores (r=0.95, n=5, p=0.012, and r=0.90, n=8, p=0.002 respectively). Lastly, VAS and PHQ-9 scores at 12 months had a strong inverse correlation (r=-0.89, n=8, p=0.003), meaning the patient's perceived QOL at 12 months was higher when less depressed.

Limitations:

This was a small, subset study evaluating the correlations between QOL post VAD (measured by the VAS tool) and depression screening (measured by the PHQ-9 tool), neither of which are specific to VAD therapy. Further research is needed in the development of appropriate disease specific tools for VAD QOL and Depression screening, and to better understand the relationships between these two topics.

Figure 1: VAS and PHQ-9 Questionnaires

To help people say how good or bad their state of health is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0.

We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your state of health is today.

Best imaginable state of health
100

For example, this response should be coded as 80

Your own state of health today

0
Worst imaginable state of health

The Patient Health Questionnaire (PHQ-9)

Patient Name _____ Date of Visit _____

Over the past 2 weeks, how often have you been bothered by any of the following problems?

	Not At all	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling asleep, staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself - or that you're a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or, the opposite - being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Column Totals _____ + _____ + _____

Add Totals Together _____

10. If you checked off any problems, how difficult have those problems made it for you to do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult

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Disclosures:

1Presenting Author has nothing to disclose. 2Minneapolis Heart Institute Foundation (MHIF); Abbott-Northwestern Hospital Foundation; Minnesota Nurses Association Foundation. 3NIH Grant funding. 4Nothing to Disclose.