Non-Clinical Factors and Outcomes of Elective Treatment of Thoracic Aortic Dissection: An Investigation of NRD

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Objectives

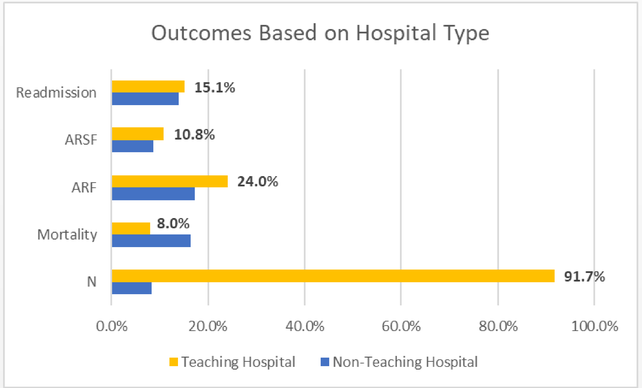
To investigate the influence of non-clinical factors on the real-world outcomes of elective thoracic aortic dissection using the Nationwide Readmission Database (NRD).

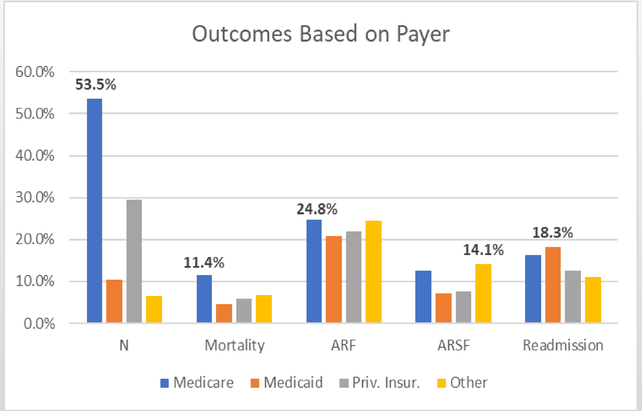
Methods

- A retrospective analysis of NRD was performed for the years 2016-2018, using ICD-10 codes for diagnoses, comorbidities and procedures.
- NRD does not differentiate acute from chronic dissections or aortic root replacement from other aortic valve surgery. Therefore, we used “elective” procedures as a surrogate for chronic and subacute aortic dissections and “aortic valve” to include all interventions on aortic valve/root.
- Patients were divided into groups based on quartiles of household income, age, gender, comorbidities, payer, size and type of treating hospitals. These were correlated with outcomes of interest including mortality, complications, length of stay and readmissions, using the following statistical methods: Chi-square test for categorical variables, Wilcoxon rank sum and Kruskal Wallis test for numerical variables and Bonferroni and Dunn’s test for post-hoc analysis. Elixhauser comorbidity index was used to compare the different groups for preexisting comorbidities.

Results

- A total of 13,247 patients underwent surgical treatment for thoracic aortic dissection, of which 2,929 were treated electively.
- Procedures of interest included descending aortic replacement (n=555) or endografting (n=950), ascending aorta/arch replacement (n=793) and aortic valve surgeries (n= 631).





Conclusion

- Elective repair of thoracic aortic dissection comprises 22% of dissection repairs.
- >90% of these procedures were performed at teaching hospitals with mortality that was less than half of that at non-teaching hospitals.
- Females have a higher risk of mortality, even though they have similar comorbidity.
- Older Medicare patients have higher comorbidity, mortality, length of stay and complications.
- Medicaid patients and those with lowest household incomes have similar outcomes as those with private insurance and with highest household incomes, except for a higher readmission rate.
- Access to healthcare even with Medicaid, assures good outcomes for this condition which requires intensive perioperative care.

Table 1

ECI = Elixhauser Comorbidity Index, ARF = Acute Renal Failure, ARSF= Acute Respiratory Failure, LOS = Length of stay,
* = $p < 0.05$, [X] = Worker's Compensation, CHAMPUS, CHAMPVA, Title V, other government programs, and self-pay.

Variables		N	Mortality n (%)	ARF n (%)	ARSF n (%)	LOS (d)	ECI	Readmit n (%)
	Total	2929	255 (8.7)	687 (23.5)	311 (10.6)	7	13	369 (15)
Age	<65	1471	**73 (5)***	342 (23.2)	**138 (9.4)***	7	**11***	192 (14.8)
	≥65	1458	**182 (12.5)***	345 (23.7)	**173 (11.9)***	7	**13***	177 (15.2)
Gender	M	1931	**137 (7.1)***	**493 (25.5)***	198 (10.3)	7	13	240 (14.4)
	F	998	**118 (11.8)***	**194 (19.4)***	113 (11.3)	7	13	129 (16.2)
Hospital Size	Small/Medium	591	60 (10.2)	133 (22.5)	54 (9.1)	**6***	12	80 (16.8)
	Large	2338	195 (8.3)	554 (23.7)	257 (11)	**7***	15	289 (14.6)
Hospital Type	Non-Teaching	244	**40 (16.4)***	**42 (17.2)***	21 (8.6)	**5***	11	26 (13.9)
	Teaching	2685	**215 (8)***	**645 (24)***	290 (10.8)	**7***	13	343 (15.1)
Payer	Medicare	1566	**178 (11.4)***	388 (24.8)	**197 (12.6)***	**7***	**13***	**206 (16.2)***
	Medicaid	308	**14 (4.5)***	64 (20.8)	**22 (7.1)***	**7***	**10***	**51 (18.3)***
	Priv. Insur.	864	**50 (5.8)***	188 (21.8)	**65 (7.5)***	**6***	**11***	**94 (12.5)***
	Other[X]	191	**13 (6.8)***	47 (24.6)	**27 (14.1)***	**8***	**19***	**18 (11)***
Household Income Percentile	0-25th	781	**56 (7.2)***	181 (23.2)	81 (10.4)	7	12	111 (16.6)
	26-50th	729	**74 (10.2)***	173 (23.7)	65 (8.9)	6	11	86 (14.5)
	51-75th	725	**77 (10.6)***	177 (24.4)	92 (12.7)	7	13	86 (14.4)
	76-100th	659	**46 (7)***	146 (22.2)	68 (10.3)	7	13	82 (14.5)