Section: Cardiology

Original Research Article

A STUDY OF CONDUCTION ABNORMALITIES IN PATIENTS WHO UNDERWENT TAVR IN A TERTIARY CARE HOSPITAL IN NORTHERN INDIA

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Abstract

Background: To study the Conduction Abnormalities in Patients who underwent TAVR procedure in a Teritiary care hospital in northern India. **Materials and Methods:** The present study was conducted in the Cardiology Department of Fortis Escorts Heart Institute, New Delhi. A total 100 severe Aortic Stenosis patients admitted for TAVR between September 2012 to June 2019 in cardiology ward of Fortis Escorts Heart Institute ,New Delhi were taken for the study. Data Capture was done till 10 June 2020 with approval obtained from the hospital authorities to collect data from the Medical Records Department [MRD]. **Result:** In the Pre TAVR ECG with total of 100 patients , 8 LBBB(n=100,8.5%), 4 RBBB (n=100,10%), 86 NSR(n=100,91.5%) were observed. The incidence of PPI in this study was 6% (n=100).On the TAVR day 0 continuous ECG monitoring mainly in the Intraprocedure time documented 44% new Conduction abnormalities. ECG in the PPI group (n=6) showed 4 CHB patients (n=6, 66.7%), 1AVB type l (n=6,16.7%),1AVB type2(n=6,16.7%). ECG in the No PPI group(n=94) showed 18 LBBB (n=94,19.1%), 8 LAFB (n=94,8.51%), 6 LAPB (n=94,6.4%), 4 IVCD (n=94,4.3%),2 AF/AFL (n=94,2.1%) , 56 NSR (n=94,59.6%). On the Post TAVR day l ECG in the PPI group (n=6) showed 2 HAVB (n=6;33.3%), 4 CHB (n=6;66.7%). In the no PPI group (n=94) ECG showed 28 (n-94.29.8%), 14 LAFB (n-94.14.9%). 10 LPFB (n=94.10.6%). 6IVCD (n 94. 6.4%), 2AF/AFL (n-94. 2.1%): 34NSR (n 94.36.2%). On the Post TAVR day7 ECG in the PPI group (n 6) showed 6 Paced rhythm (n-6,100%). ECG in the No PPI group (n-94) showed 26 LBBB (n=94.26.71%)10 LAFB (n=94.10.6%)SLPFB (n 94.8.5%). 4BFB (n=94.4.3%%), 2TFB(n=94.2.1%).181VCD(n-94.19.1%).4AVBI (n=94.4.3%, 4AF/AFI (n=94.4.3%).ISNSR (n=94.19.1%) On the Post TAVR days 30 ECG in the PPI group (n=6) showed 6 Paced rhythm(n=6.100%). ECG in the No PPI group(n=94) showed 18LBBB (n=04.19.1%), GLAFB (n=94.6.4%). 4LPFB (n=94.4.3%). 101VCD (n=94.10.6%). 1AVBI (1=94.1.1%). 2AF/AFL (n=94.2.1%). S3NSR (n=94.56.4%). At Post TAVR 3 Months ECG in the PPI group(n=6) showed 6 Paced rhythm (n=6,100%). ECG in the No PPI group (n=94) showed 16LBBB (n=94.17%),4LAFB (n=94.4.3%). 2LPFB (n=94.2.1%). 4IVCD (n=94,4.3%). 1AF/AFI (n=94.1.1%). 67NSR (n=94.71.3%). At Post TAVR 6 Months ECG in the PPI group(n=6) showed 6 Paced rhythm (n=6.100%). ECG in the No PPI group (n=94) showed 12 LBBB (n=94.12.8%). 82 NSR (n=94.71.3%). At Post TAVR year ECG in the PPI group (n=6) showed 6 Paced rhythm (n=6.100%). ECG in the No PPI group

(n=94) showed 8 LBBB (n=94.17%). 86 NSR (n=94.71.3%). **Conclusion:** Conduction abnormality is a common complication after TAVR which if not managed optimally can lead to unnecessary increased PPI incidence. Overall documented new Conduction abnormality was 44% and incidence of new LBBB was 28%. Significant number of Conduction abnormalities can resolve overtime and unnecessary PPI can be avoided with careful pre TAVR work up, skillful operators and diligent follow up.

INTRODUCTION

Ever Since the first Transcatheter Implantation of Aortic valve (TAVR) in 2002, it has emerged as an alternative to surgical aortic valve replacement (SAVR) for patients deemed at high or prohibitive risk for surgery.[1-4] TAVR is a minimally invasive alternative to conventional aortic valve replacement in symptomatic patients with severe aortic stenosis and contraindications to surgery. The procedure has shown to improve patient's quality of life and prolong short- and mid-term survival in high-risk individuals, becoming a widely accepted therapeutic option which has been integrated into current clinical guidelines for the management of valvular heart disease. Substantial improvements in technology, patient selection, and refined procedural techniques have provided the basis for TAVRs expansion toward treating a lower surgical risk aortic stenosis population.[5] Severe Calcific aortic stenosis (AS) is a progressive disease that results in calcified and stiff valve leaflets increasing the left ventricular (LV) afterload. The prevalence of AS ranges from 3 to 23% and a total of 2 to 5% of all adults have significant disease with symptoms of dyspnea, angina and/or syncope.[6] TAVR consists of a catheter-based procedure performed on a beating heart without sternotomy and cardio-pulmonary bypass in which a trileaflet bioprosthetic valve is implanted in the aortic root position. In its current state, TAVR represents a transformative technology with the potential to improve symptoms and prolong life in patients who previously had no surgical options, which was underlined by the landmark Placement of Transcatheter Aortic Valves (PARTNER) randomized controlled trials.[7]

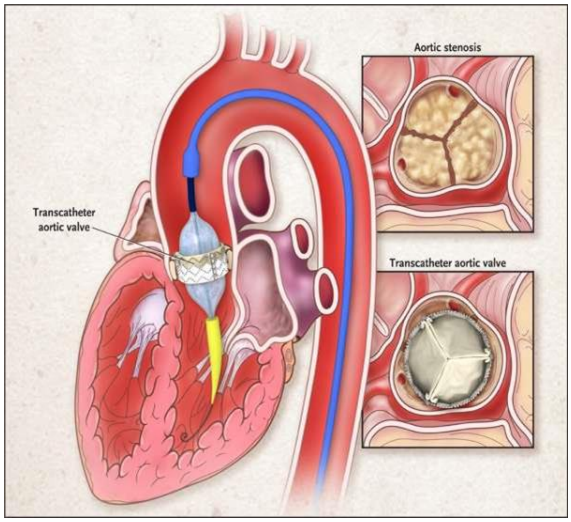

Image 1: transcatheter aortic valve placement (femoral approach)

TAVR is associated with a number of adverse events such as, mortality, cerebrovascular events, bleeding and vascular complications, conduction abnormalities and paravalvular aortic regurgitation.[8] Conduction disturbances and the need for permanent pacemaker implantation (PPI) frequently complicate TAVR. Importantly, the incidence of such complications has not changed significantly over time, with potentially a slightly rising incidence after the introduction of newer generation transcatheter valves.[9]

Although the factors associated with conduction abnormalities and PPI post-TAVR are well described,[10] data on its clinical impact remain controversial. Studies evaluating the impact on mortality of new-onset left bundle branch block (LBBB) or need for Periprocedural PPI post- TAVR have yielded conflicting results.[11]

MATERIALS AND METHODS

Study Area: The present study will be conducted in the Cardiology Department of Fortis Escorts Heart Institute, New Delhi.

Study Population: A total 100 severe Aortic Stenosis patients admitted for TAVR between September 2012 to June 2019 in cardiology ward of Fortis Escorts Heart Institute, New Delhi will be taken for study. Data Capture will be done till 10 June ,2020 with approval obtained from the hospital

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authorities to collect data from the Medical Records Department [MRD].

Inclusion Criteria

- Patients who underwent TAVR procedure

Exclusion Criteria

- Unsuccessful procedure
- Conversion to Open Procedure
- Patients already on PPM/CRT-D
- Prior Aortic Valve Surgery
- Valve in Valve TAVR
- Low Flow Low Gradient Aortic Stenosis

Study Design: A Retrospective Observational Cohort Study.

Study Duration: 12 Months

Methodology: All patients who underwent TAVR procedure after evaluated by a Cardiologists team. All the parameters are collected from the Medical records department as mentioned in the study proforma at different periods upto the follow up period of 1 year. Online calculator used for Log Euroscore, STS PROM score , e GFR.

Data Collection Forms: The data will be collected from the MRD in Pre-tested study Proforma (attached) which includes various parameters like Age, sex, past history, Blood investigations, ECG, Echocardiography and Imaging data (Baseline).

Statistical method

Statistical analysis: Data were entered in MS-Excel and analyzed in SPSS V24.Descriptive statistics were represented with percentages, Mean with SD or Median with IQR depends on nature of the data. Shapiro wilk test was applied to find normality. Chi-square test, Fisher Exact test, Independent t-test, Mann-whitney U test were calculated. P<0.05 was considered as statistically significant. Statistical Package for Social Sciences version 23 (SPSS Inc, IBM, New York, United State

RESULTS

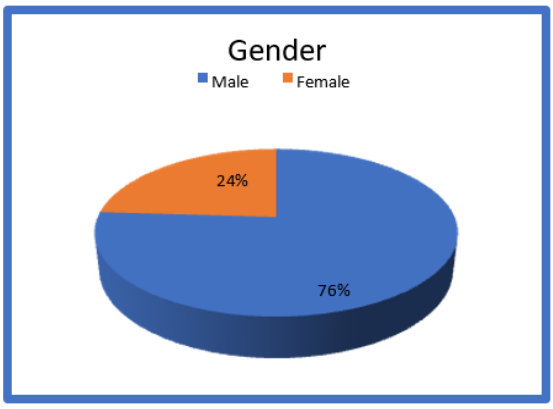

Figure 1: Showing Gender Distribution

The above chart and Figure shows the gender distribution with Male 76% and Female 24% in the sample size of 100 TAVR patients of this study.

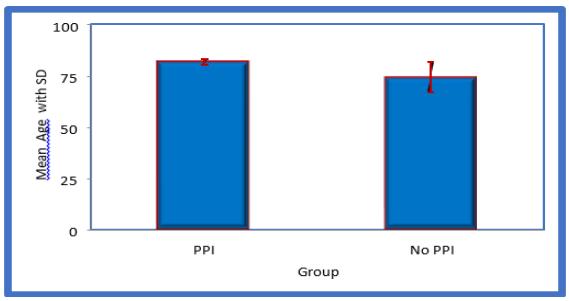

Figure 2: shows the mean age is higher in PPI group compared to the No PPI group with significant P value (P<0.05)

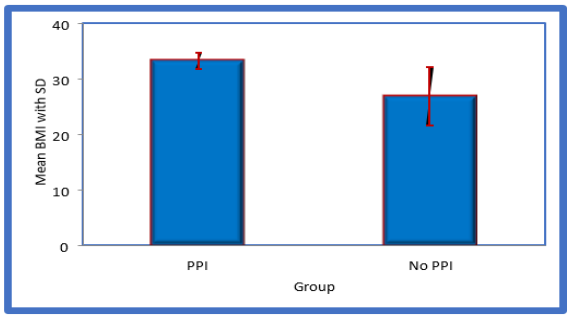

Figure 3: shows the mean BMI is higher in PPI group compared to the No PPI group with significant P value (P<0.05)

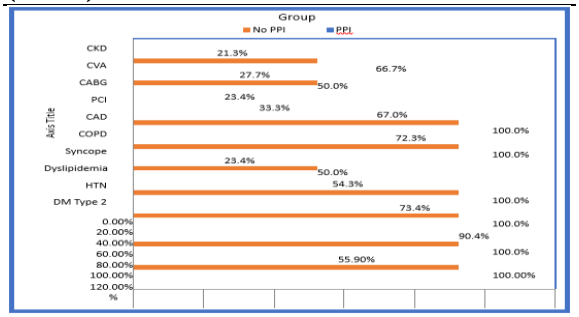

Figure 4: Shows the different co morbid conditions between PPI and No PPI groups with the significant P value in Diabetes Mellitus (type 2) and CKD.

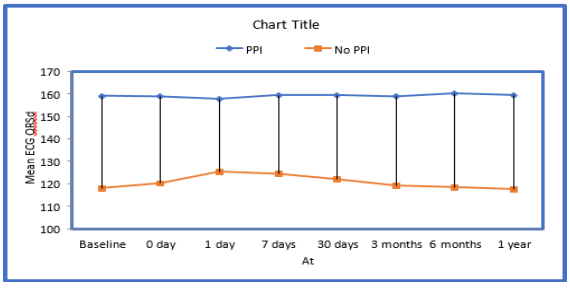

Figure 5: Shows the significant P Value in the QRS duration measurements at different time periods.

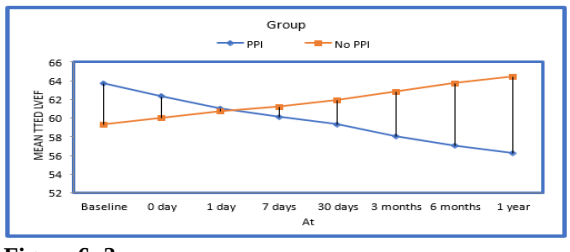

Figure 6: ?

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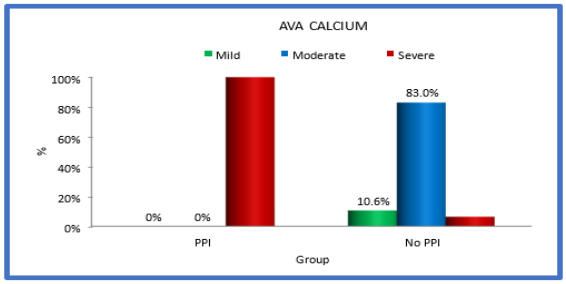

Figure 7: Shows Aortic Valvular Area Calcium grading between PPI group and No PPI group with Statistical Significance with higher grades in PPI group . (P<0.05)

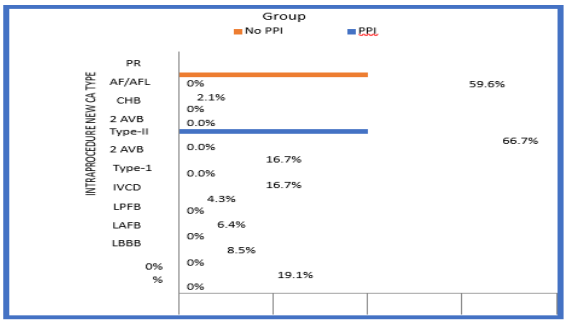

Figure 8 : Shows Intraprocedure New CA types between PPI group and No PPI group with Statistical Significance. (P<0.05)

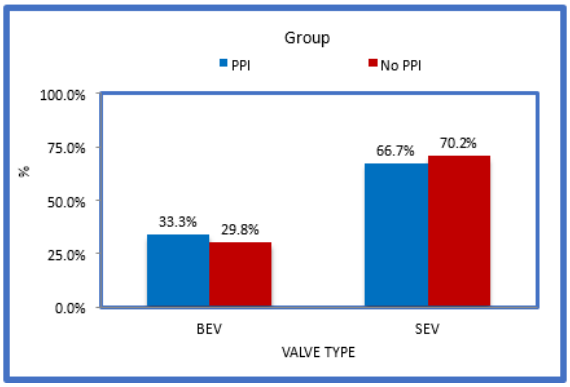

Figure 9: Shows the THV types (BEV vs SEV) with no statistical significance.

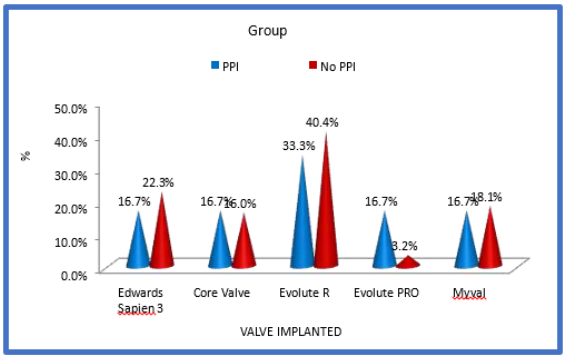

Figure 10: Shows the THV make between PPI group and No PPI group with no Statistical Significance. (P<0.05)

Table 1: Showing Gender Distribution.

Sex	Frequency	Percent
Male	76	76
Female	24	24
Total	100	100.0

Table 2: Shows the Baseline variables of TAVR patients.

Variable									P-value
		PPI (n=6)				No PPI (n=94)			
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
Age	81.83	1.33	82.0	2	74.1	7.4	75.0	8.0	0.002
Height	135.6	66.4	163.5	59.9	160.8	9.4	161.5	15.3	0.760
Weight	76.2	3.9	76.5	4.5	70.8	11.3	70.5	13.3	0.114
BMI	33.2	1.5	33.0	2.6	26.8	5.3	25.8	5.7	0.003
Body Surface Area	1.7	0.2	1.8	0.4	1.7	0.1	1.7	0.2	0.709

Table 3: Shows the different co morbid conditions.

Variable					P-value
	PPI (n=6)		No PPI (n=94)		
	Count	%	Count	%	
DM Type 2	6	100.0%	52	55.9%	0.04
HTN	6	100.0%	85	90.4%	1
Dyslipidemia	6	100.0%	69	73.4%	0.33
Syncope	6	100.0%	51	54.3%	0.04
COPD	3	50.0%	22	23.4%	0.16
CAD	6	100.0%	68	72.3%	0.34
PCI	6	100.0%	63	67.0%	0.17
CABG	2	33.3%	22	23.4%	0.63
CVA	3	50.0%	26	27.7%	0.35
CKD	4	66.7%	20	21.3%	0.03

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Table 4: Shows the different co morbid conditions between PPI and No PPI groups with the significant P value in Diabetes Mellitus (type 2) and CKD.

Variable		PPI				No PPI			P-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
LOG EURO SCORE	24.1	2.9	23.4	3.7	19.7	3.8	18.4	2.5	0.006
STS PROM SCORE	12.9	0.8	12.7	1.0	11.6	1.0	11.5	1.1	0.001

Table 5: Show the higher Log EURO and STS PROM scores in PPI Group with significant P value.

Variable		PPI				No PPI			P value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
ECG QRSd Baseline	159.0	7.3	158.0	12.5	118.0	13.1	117.5	8.0	<0.001
ECGQRSd @0 day	158.7	3.5	159.0	5.5	120.1	14.1	118.0	8.0	<0.001
ECG QRSd @1day	157.7	2.7	156.0	4.5	125.2	17.8	118.5	32.0	<0.001
ECGQRSd @7 days	159.3	2.7	159.0	3.5	124.3	17.1	118.5	27.0	<0.001
ECGQRSd @30 days	159.3	2.1	160.0	3.0	121.9	16.7	118.0	8.0	0.001
ECGQRSd @3 months	158.7	2.4	159.0	4.5	119.1	12.8	118.0	9.0	<0.001
ECGQRSd @ 6months	160.0	2.8	160.0	5.0	118.4	11.8	118.0	8.0	<0.001
ECGQRSd @ 1year	159.3	2.4	159.0	4.5	117.5	10.3	118.0	8.0	<0.001

Table 6: Shows the significant P Value in the QRS duration measurements at different time periods.

Variable			PPI			No PPI			P-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
ECG PRinterval@ Baseline	169.3	21.5	173.0	29.5	166.4	21.5	168.0	37.5	0.833
ECG PRinterval@ 0 day	200.3	53.9	188.0	91.5	166.4	21.7	168.0	38.5	0.119
ECG PRinterval @1day	184.3	37.7	179.0	51.0	166.4	21.7	168.0	38.5	0.271
ECG PRinterval @7day	169.0	22.1	173.0	34.0	169.6	25.9	168.0	39.0	0.970
ECG PRinterval @30 days	165.7	21.6	164.0	32.5	166.4	21.7	168.0	38.5	0.923
ECG PRinterval @3months	165.7	21.6	164.0	32.5	166.4	21.6	168.0	38.0	0.918
ECG PRinterval @6months	165.7	21.6	164.0	32.5	166.4	21.5	168.0	37.5	0.913
ECG PRinterval @1year	165.7	21.6	164.0	32.5	166.4	21.5	168.0	37.5	0.913

Table 7: Shows the PR interval measurements in ECG recordings at different time periods with no statistical significance (P> 0.05)

Variable		PPI				No PPI			P-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
TTED LVEF(%) @Baseline	63.7	2.3	64.0	4.5	59.3	4.5	58.0	8.0	0.020
TTED LVEF @0 days	62.3	2.3	60.0	4.5	60.0	4.3	58.0	8.0	0.540
TTED LVEF @1 days	61.0	2.2	60.0	3.0	60.7	3.9	60.0	6.0	0.808
TTED LVEF @7 days	60.1	2.4	60.0	4.5	61.2	3.7	60.0	6.0	0.154
TTED LVEF @30 days	59.3	1.6	55.0	2.5	61.9	3.6	62.0	4.3	<0.001
TTED LVEF @3 montsh	58.0	2.1	53.0	3.0	62.8	3.5	64.0	6.0	<0.001
TTED LVEF @6months	57.0	1.8	48.0	4.0	63.7	3.0	64.0	4.0	<0.001
TTED LVEF@1 year	56.2	1.5	40.0	2.5	64.4	2.6	65.0	2.0	<0.001

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Table 8

Variable		PPI				No PPI			Pvalue
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
CT SCAN AAN size(mm)	26.2	1.8	22.7	2.9	21.6	1.9	21.4	2.4	0.041

Table 9: Shows the Aortic Annular Size Larger in PPI group (mean 26.2) compared to No PPI group with Statistical Significance.

Variable		PPI				No PPI			P value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
MSH(mm)	3.1	0.2	4.7	0.3	4.6	0.2	4.7	0.5	0.988

Table 10: Shows the Membrane Septal Height shorter PPI group (mean 3.1mm) compared to No PPI group with Statistical Significance.

Variable		PPI				No PPI			P value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	
THV Oversizing (%)	17.7	1.5	18.0	2.5	13.8	1.7	14.0	1.0	<0.001
THV SIZE(mm)	27.5	2.5	29.0	3.8	23.2	2.5	23.0	3.0	0.042
Implantation Depth of THV	6.8	0.3	6.8	0.3	4.7	0.5	4.8	0.9	<0.001

Table 11: Shows Aortic Valvular Area Calcium grading between PPI group and No PPI group with Statistical Significance with higher grades in PPI group . (P<0.05)

INTRAPROCEDURE NEW CA TYPE	PPI		No PPI	
	Count	%	Count	%
LBBB	0	0%	18	19.1%
LAFB	0	0%	8	8.5%
LPFB	0	0%	6	6.4%
IVCD	0	0%	4	4.3%
2 AVB Type-1	1	16.7%	0	0%
2 AVB Type-II	1	16.7%	0	0%
CHB	4	66.7%	0	0%
AF/AFL	0	0%	2	2.1%
PR	0	0%	56	59.6%
Total	6	100.0%	94	100.0%
	P<0.001			

Table 12: Shows Intra-procedure New CA types between PPI group and No PPI group with Statistical Significance. (P<0.05)

Variable	Category	PPI		No PPI		P-value
		Count	%	Count	%	
ECG @BASELINE	NSR	0	0%	86	91.5%	<0.001
	LBBB	2	33.3%	8	8.5%	
	RBBB	4	66.7%	0	0%	
ECG @O day	NSR	0	0%	56	59.6%	<0.001
	LBBB	0	0%	18	19.1%	
	LAFB	0	0%	8	8.5%	
	LPFB	0	0%	6	6.4%	
	IVCD	0	0%	4	4.3%	
	2 AVB Type-1	1	16.7%	0	0%	
	2 AVB Type-II	1	16.7%	0	0%	
	CHB	4	66.7%	0	0%	
	AF/AFL	0	0%	2	2.1%	
ECG @ 1 day	NSR	0	0%	34	36.2%	<0.001
	LBBB	0	0%	28	29.8%	
	LAFB	0	0%	14	14.9%	
	LPFB	0	0%	10	10.6%	
	IVCD	0	0%	6	6.4%	
	HAVB	2	33.3%	0	0%	
	AF/AFL	0	0%	2	2.1%	
	Paced Rhythm	4	66.7%	0	0%	
ECG @7 days	NSR	0	0%	18	19.1%	<0.001
	LBBB	0	0%	26	27.7%	
	LAFB	0	0%	10	10.6%	
	LPFB	0	0%	8	8.5%	
	BFB	0	0%	4	4.3%	
	TFB	0	0%	2	2.1%	
	IVCD	0	0%	18	19.1%	
	1 AVB	0	0%	4	4.3%	
	AF/AFL	0	0%	4	4.3%	

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	Paced Rhythm	6	100.0%	0	0%	
ECG @30 days	NSR	0	0%	53	56.4%	<0.001
	LBBB	0	0%	18	19.1%	
	LAFB	0	0%	6	6.4%	
	LPFB	0	0%	4	4.3%	
	IVCD	0	0%	10	10.6%	
	1 AVB	0	0%	1	1.1%	
	AF/AFL	0	0%	2	2.1%	
	Paced Rhythm	6	100.0%	0	0%	
ECG @3months	NSR	0	0%	67	71.3%	<0.001
	LBBB	0	0%	16	17.0%	
	LAFB	0	0%	4	4.3%	
	LPFB	0	0%	2	2.1%	
	IVCD	0	0%	4	4.3%	
	AF/AFL	0	0%	1	1.1%	
	Paced Rhythm	6	100.0%	0	0%	
ECG @6months	NSR	0	0%	82	87.2%	<0.001
	LBBB	0	0%	12	12.8%	
	Paced Rhythm	6	100.0%	0	0%	
ECG @1 year	NSR	0	0%	86	89.4%	<0.001
	LBBB	0	0%	8	10.6%	
	Paced Rhythm	6	100.0%	0	0%	

Table 13: Shows the Overall ECG recordings and New CA types recordings in the different time period between PPI group and No PPI group with Statistical Significance. (P<0.05)

VALVE TYPE	PPI		No PPI	
	Count	%	Count	%
BEV	2	33.3%	28	29.8%
SEV	4	66.7%	66	70.2%
Total	6	100.0%	94	100.0%
	P=1			

Table 14: Shows the THV types (BEV vs SEV) with no statistical significance.

VALVE IMPLANTED	PPI		No PPI	
	Count	%	Count	%
Edwards Sapien 3	1	16.7%	21	22.3%
Core Valve	1	16.7%	15	16.0%
Evolute R	2	33.3%	38	40.4%
Evolute PRO	1	16.7%	3	3.2%
Myval	1	16.7%	17	18.1%
Total	6	100.0%	94	100.0%
	P=0.61			

Table 15: Shows the THV make between PPI group and No PPI group with no Statistical Significance. (P<0.05)

TPI	PPI		No PPI	
	Count	%	Count	%
Yes	6	100.0%	0	0%
No	0	0%	94	100.0%
Total	6	100.0%	94	100.0%
	P<0.001			

Table 16: Shows the TPI and PPI placements in the total TAVR patients with Statistical Significance. (P<0.05)

PPI REQUIRED	PPI		No PPI	
	Count	%	Count	%
Yes	6	100.0%	0	0%
No	0	0%	94	100.0%
Total	6	100.0%	94	100.0%
P<0.001				

Table 17: Shows the TPI and PPI placements in the total TAVR patients with Statistical Significance. (P<0.05)

PPI TIMING		PPI
	Count	%
8-30 days	5	83.3%
0 day	1	16.7%
Total	6	100.0%

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DISCUSSION

In our study overall documented New CA was 44% and incidence of new LBBB was 28%. The incidence of PPl in this study was 6% (n=100). The incidence of PPI was 6.7% (n=9785) in a similar study by Opeyemi O, Fedahunsi el al. The management of these conduction abnormalities involved diligent follow up and Permanent Pacemaker Implantation according to the Standard Guidelines. The Data was tabulated according to two groups PPI group and No PP1 group and further ECG recording were analysed accordingly.

Overall ECG recordings and New CA types recordings in the different time period between PPI group and No PPI group with Statistical Significance (P<0.05) is shown in chart 9. In the Pre TAVR ECG with total of 100 patients, 8 LBBB(n=100,8.5%), 4 RBBB (n=100,10%), 86 NSR(n=100,91.5%) were observed. On the TAVR day 0 continuous ECG monitoring (shown in Chart 10) mainly in the Intra-procedure time documented 44% new CA as mentioned earlier. ECG in the PPI group (n=6) showed 4 CHB patients (n=6, 66.7%), 1AVBtypel (n=6,16.7%),1AVB type2(n=6,16.7%). ECG in the No PPI group(n=94) showed 18 LBBB (n=94,19.1%), 8LAFB (n=94,8.51%), 6LAPB (n=94,6.4%), 4IVCD (n=94,4.3%), 2AF/AFL (n=94,2.1%), 56 NSR (n=94,59.6%).

These patients underwent continuous bedside ECG monitoring till discharge at day 7, then periodic ECG recordings at 30 days and 3 months ,6 months and I year noted. On the Post TAVR day l ECG in the PPI group (n=6) showed 2 HAVB (n=6,33.3%), 4 CHB (n=6,66.7%). In the No PPI group (n=94) ECG showed 28 ¡BBB (1-94.29.8%), 14LAFB (11-94.14.9%). 1OLPFB (n=94.10.6%). 6IVCD (n 94. 6.4%), 2AF/AFL (n-94. 2.1%): 34NSR (n 94.36.2%). On the Post TAVR Day7 ECG in the PPI group (n 6) showed 6 Paced rhythm (n-6,100%). ECG in the No PPI group (n-94) showed 26LBBB (n=94.26.71%) 10LAFB (n=94.10.6%) SLPFB (n 94.8.5%). 4BFB (n=94.4.3%%), 2TFB (n=94.2.1%).181VCD (n-94.19.1%). 4AVBI (n=94.4.3%), 4AF/AFI. (n=94.4.3%). ISNSR (n=94.19.1%) On the Post TAVR Days 30 ECG in the PPI group(n=6) showed 6 Paced rhythm(n=6.100%). ECG in the No PPI group(n=94) showed 18LBBB (n=04.19.1%), GLAFB (n=94.6.4%). 4LPFB (n=94.4.3%). 101VCD (n=94.10.6%). 1AVBI (1=94.1.1%). 2AF/AFL (n=94.2.1%). S3NSR (n=94.56.4%).

At Post TAVR 3 Months ECG in the PPI group(n=6) showed 6 Paced rhythm (n=6,100%). ECG in the No PPI group (n=94) showed 16LBBB (n=94.17%), 4LAFB (n=94.4.3%). 2LPFB (n=94.2.1%). 4IVCD (n=94,4.3%). 1AF/AFI (n=94.1.1%). 67NSR (n=94.71.3%).

At Post TAVR 6 Months ECG in the PPI group(n=6) showed 6 Paced rhythm (n=6.100%). ECG in the No PPI group (n=94) showed 12 LBBB (n=94.12.8%). 82 NSR(n=94.71.3%). At Post TAVR year ECG in the PPI group (n=6) showed 6 Paced rhythm (n=6.100%). ECG in the No PPI group (n=94) showed 8 LBBB (n=94.17%). 86 NSR(n=94.71.3%). So in Summary 4 BBB patients developed CHB with symptoms of bradycardia, 2 LBBB patients developed AVB type 1 and type 2 which eventually progressed to higher degree A VB (HAVB) with symptoms of bradycardia and required PPI. Four CHB patients underwent PPI between day 3 to day 5 and two unresolved HAVB patients underwent PPI on day 6 post TAVR. And no further CHB or HAVB observed apart from these patients.

Limitations of the study

This study had a sample size 100 and a follow up period of one year. The number of pacemaker implantation was 6% which is a small number and has a statistical limitation in extrapolating the predictors and clinical outcomes to a large number of patients who did not require Pacemaker implantation. Also, the meticulous planning and the skillful operating TAVR Team of cardiologists and the advanced ECG Gated CT Scan has overall reduced the PPI incidence. Hence a larger sample size and longer follow up period would be ideal in the TAVR Programme to more effectively highlight the incidence, predictors and outcomes of conduction abnormalities in post TAVR patients.

CONCLUSION

Conduction abnormality is a common complication after TAVR which if not management optimally can lead to unnecessary increased PPI incidence which in turn leads to increased monetary burden, hospital stay and Heart failure complications. overall documented new Conduction abnormality was 44% and incidence of new LBBB was 28%.

This study although had a small sample size and small PPI rates still it highlights that a significant number of Conduction abnormalities can resolve overtime and unnecessary PPI can be avoided with careful pre TAVR work up. Skilful operators and diligent follow up.

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