

## Seasonal Variation of Pacemaker Implantation during the Year 2010-2014 in Ranchi: A Secondary Data Analysis

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### Abstract

**Introduction:** A pacemaker is a small device which is placed in the chest or abdomen to help control abnormal heart rhythm. Its uses are in patients of sinus node dysfunction ,AV node dysfunction atrial fibrillation, syncope –severe and frequent, AV block post MI, some CHF patients.

**Objective:** To evaluate seasonal variation of pacemakers' implantation of the period of the year 2010-14 at super specialty cardiology Department, Rajendra Institute of Medical Sciences (RIMS) and APOLLO hospital, Ranchi.

**Methods:** This study is based on records available with cardiology department, RIMS, Ranchi and APOLLO hospital, Ranchi of the year 2010-2014.

**Results:** A total of 1053 pacemaker were implanted in these five years .Out of 1053 pacemaker, 401 pacemakers and 652 pacemakers implanted at cardiology, department, RIMS and APOLLO hospital respectively. Majority [773, 73.41%] of the patients were male. Most [715, 67.9%] of the patients were belonging to more than 60 years of age. Three patients out of 1053 pacemakers implanted in both hospitals were belonging to less than 20 years. 63(6%) patients out of these were belonging to 21-40 years. Majority [776, 74%] of the patients were Hindu. Majority of the patients were non-tribal. During the period of January to June, implantation of Pacemaker was higher than rest of the year in both hospitals.

**Conclusion:** This study concludes geriatrics and male patients are more vulnerable as per pacemakers' implantation is concerned and it was more in 1<sup>st</sup> six month of the year.

### I. Introduction

In the area of cardiac stimulation, significant advances have been taken place since Elmqvist and Senning<sup>1</sup> first implanted a complete cardiac pacemaker system in 1958. Miniaturized intracardiac devices have replaced earlier external systems and epicardial electrodes, which were difficult to set up. These advances, combined with technological and pharmacological progress in the areas of surgery and anaesthesia, have both made possible and stimulated the search for alternatives to traditional hospitalization in the field. A pacemaker is a small device which is placed in the chest or abdomen to help control abnormal heart rhythm. Its uses are in patients of sinus node dysfunction ,AV node dysfunction, atrial fibrillation, syncope –severe and frequent, AV block post MI, some CHF patients. Pacemaker implantation is the primary therapeutic intervention in patients with symptomatic SA node dysfunction<sup>2</sup>. The main aim of the study is to evaluate the seasonal variation of pacemakers' implantation of the period of year 2010-14 at super specialty cardiology Department, Rajendra Institute of Medical Sciences (RIMS) and Apollo hospital, Ranchi

### II. Material And Methods

This study is based on records available at super specialty cardiology Department, Rajendra Institute of Medical Sciences (RIMS), Ranchi and Apollo hospital, Ranchi of the period of 2010-2014. After obtaining the data in prescribed format, data were fed in MS Excel and data analyses were done through SPSS software. A total of 1053 pacemakers were implanted in these five years in both hospitals. Tabular and Graphical representation like bar graphs were plotted to establish the seasonal variation in both hospitals. Age, sex and religion wise data were analyzed.

### III. Results

**Table 1: Year wise frequency distribution of Pacemakers implantation at RIMS and APOLLO hospital**

Years	Year Number	Pacemakers implantationat		Total installation
		RIMS	APOLLO	
2010	1	18	142	160
2011	2	66	162	228

2012	3	73	142	215
2013	4	109	114	223
2014	5	135	92	227
Total		401	652	1053

Table 1 shows that year wise distribution of Pacemakers’ implantation at RIMS and APOLLO hospital. Out of 1053 implantation 401 and 652 pacemakers were implanted at RIMS and APOLLO hospital respectively.

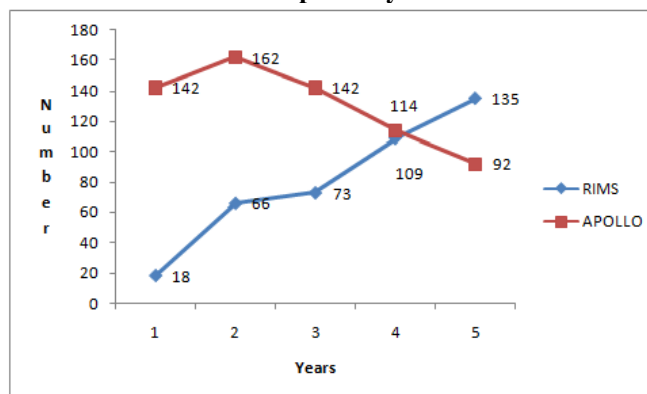


Figure 1: Line graph showing the trend of pacemakers’ implantation in RIMS and APOLLO hospital. Figure 1 shows that pacemakers’ implantation was increasing trend at RIMS whereas in APOLLO hospital we found that it was decreasing trend.

Table 2: Sex wise distribution of the patients (N=1053)

Years	Year’s number	Sex of pacemakers implanted patients				Total
		At RIMS		At APOLLO		
		Male	Female	Male	Female	
2010	1	13	5	106	36	160
2011	2	46	20	110	52	228
2012	3	57	16	114	28	215
2013	4	77	32	82	32	223
2014	5	98	37	70	22	227
Total		291	110	482	170	1053

Table 2 shows that out of 1053 patients, 773(73.41%) were male and 283(26.69%) were female. In Both hospitals males were dominant i.e., out of 401 patients, 291(72.57%) of RIMS and out of 652 patients, 482 (74%) of APOLLO, Ranchi were males.

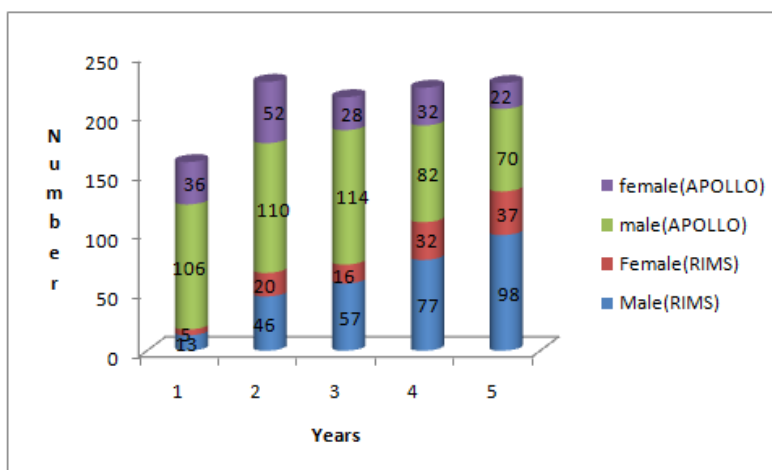


Figure 2: Bar graphs showing the males are dominant in all years in both hospitals.

Table 3: Age (yrs.) distribution of the patients

Years	Year	Age groups (yrs)										Total
		At RIMS					At APOLLO					
		<20	20-40	41-60	61-80	>80	<20	20-40	41-60	61-80	>80	

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2010	1	0	2	3	8	5	0	3	44	87	8	160
2011	2	0	5	8	30	23	0	2	49	101	10	228
2012	3	0	4	13	36	21	1	8	37	85	10	215
2013	4	1	11	23	56	18	1	4	31	63	15	223
2014	5	0	20	36	51	27	0	4	28	55	6	227
<b>Total</b>		<b>1</b>	<b>42</b>	<b>83</b>	<b>181</b>	<b>94</b>	<b>2</b>	<b>21</b>	<b>189</b>	<b>391</b>	<b>49</b>	<b>1053</b>

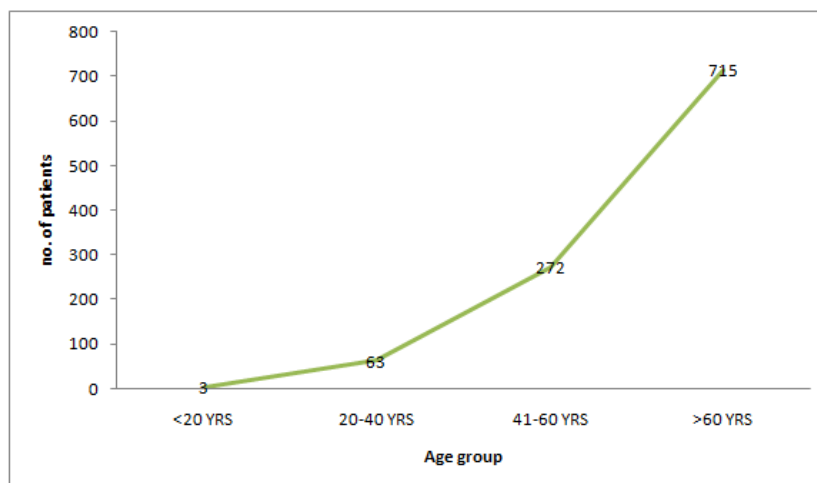


Figure3: Line graph showing number of pacemakers increase with respect to age. Figure 3 shows most [715(67.9%)] patients were older than 60 years

Table 4: Religion of the Patients

Religion						Total
At RIMS			At APOLLO			
Hindu	Muslim	Christian	Hindu	Muslim	Christian	
307	66	28	469	131	52	1053

Table shows that out of 1053 patients, 776(73.7%) are Hindu, 197(18.7%) are Muslim and 80(7.6%) are Christian.

Table 5: Race of the Patients

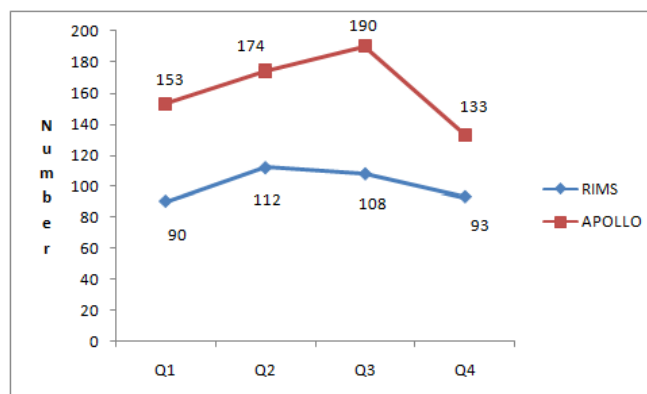
Race of the patients						Total No. of patients
At RIMS			At APOLLO			
Tribal	Non tribal	Total	Tribal	Non tribal	Total	
28	373	401	52	600	652	1053

Table 5 shows that a only 70(7%) patients are tribal and majority 983 (93%) of the patients are non-tribal

Table 6: Quarterly variation in pacemakers' implantation at RIMS and APOLLO hospitals from 2010-2014

Years	Year's number	Quarterly								Total
		At RIMS				At APOLLO				
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
2010	1	3	10	5	34	42	31	35	160	
2011	2	11	19	14	22	33	42	56	31	228
2012	3	23	18	13	18	37	38	42	24	215
2013	4	26	36	27	20	25	29	35	25	223
2014	5	30	36	44	28	24	23	26	18	227
<b>Total</b>		90	112	108	93	153	174	190	133	1053

Q1: January-March; Q2: April-June; Q3: July-September; Q4: October- December



**Figure 4: Trend of pacemakers' implantation from Q1 to Q4 at RIMS and APOLLO hospital.**

Figure 4 showing the increasing trend of pacemakers' implantation from Q1 to Q3 and dropped in Q4 at APOLLO hospital whereas at RIMS increasing trend from Q1 to Q2 and slight decreased from Q2 to Q4 was found.

#### IV. Discussion

This study is based on secondary data analysis. In this study, data were collected from two big hospitals in Ranchi city- RIMS and APOLLO hospitals in prescribed format of the year 2010-2014. This study is attempted to see the variation of pacemakers' implantation in respect to age, sex, race, religion and season during 2010-14. A total of 1053 pacemakers' implanted during these five years in both hospitals. Out of these, three fourth are males. This finding also supported the previous study conducted by Veeraeddy ( 2007) <sup>3</sup>. The majority of the patients had complete heart block. The mean (SD) age of the patients was 65.3(12) years. Most [715(67.9%) out of 1053] were older than 60 years. Out of 1053 patients, 776(73.7%) are Hindu, 197(18.7%) are Muslim and 80(7.6%) are Christian. Majority (92%) of the patients were non tribal. The increasing trend was found of pacemakers' implantation from Q1 to Q3 and dropped in Q4 at APOLLO hospital whereas at RIMS increasing trend from Q1 to Q2 and slight decreased from Q2 to Q4 was found. In both hospitals, January to June have high pick of pacemakers implantation. Similar results were obtained in a study done in north east province of Iran where pace maker implantation was greater in winter and spring than in other seasons<sup>4</sup>. This study is also supported by the study done in Berlin Germany where pace maker implantation was higher in winter season as compared to June<sup>5</sup>.

#### V. Conclusion

This study concludes geriatrics and male patients are more vulnerable as per pacemakers implantation is concerned. Facility and special precaution in the hospital must be addressed during in the months of January to June. In this period there is high pick of pacemakers' implantation.

#### Limitation

This study is record based. There is restriction of data collection; we have only procured information those are available with the records. We have missed data like height, weight, BMI, education, occupation, food habit, salt intake, physical activity, behaviour of the patients, co morbidity of patients etc. So we could not establish any association with these variables with pacemakers' implantation and we have no contact number to follow up the patients about their condition as per pacemakers implantation is concerned.

#### Acknowledgement

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