# RESULTS

This study included 122 patients referred to pacemaker follow up clinics for follow up of their permanent VVI pacemakers.

## Demographic characteristics of all patients:

- The mean age of patients was 66.1 ± 11years.
- 7 patients were less than 40 years old, 54 patients were older than 40 years and less than 70 years old, and 51patients were more than 70 years old.
- 61 patients were males and 61 patients were females.

| | | |
|---|---|---|
| **Age(years)** | Mean ± SD | 66.1 ± 11. |
| **Sex** | Male | 61 |
| | Female | 61 |

**Table (1) Demographic characteristics of all patients**

Table (1): shows that the mean age of patients was 66.1 ± 11years, the majority of patients 75(61.5%) were >65 years old (table 2), 61 patients were males and 61 patients were females.

| AGE IN YEARS | FREQUENCY | | | Percent of age |
|---|---|---|---|---|
| | Total no. | M | F | |
| < 40 | 7 | 4 | 3 | 5.7% |
| 40-49 | 6 | 3 | 3 | 4.9% |
| 50-59 | 13 | 5 | 8 | 10.7% |
| 60-69 | 45 | 22 | 23 | 36.9% |
| ≥ 70 | 51 | 27 | 24 | 41.8% |

**Table 2: distribution of patients in different age groups**

**Relation between atrial rhythm and sex (table4):**

***Group I:*** **included 86 male patients (74.8%) and 29 female patients (25.2%).**
***Group II:*** **included 15 male patients (88.2%) and 2 female patients (11.8%).**

- **There was no statistically significant difference between patients in both groups as regard sex (p=0.22) (table 4).**

**Electrocardiographic findings:**

- All the patients were dependant on their pacemakers and had a preimplant atrial sinus rhythm.
- 89 patients (72.5%) had an atrial sinus rhythm at the time of follow up.
- 33 patients (27.5%) had AF at the time of follow up.

**Patients were divided according to their atrial rhythm into two groups:**

**Group I*:*** included patients with atrial sinus rhythm at the time of follow up. They were 89 (72.5%) patients.

**Group II*:*** included patients with AF at the time of follow up. They were 33(27.5%) patients.

**Relation between atrial rhythm and age :**

| | | | **Rhythm groups** | | Total | P value |
|---|---|---|---|---|---|---|
| | | | Group I | Group II | | |
| Age | above 65 | Count/percent | 53(59.6 %) | 22(66.7%) | 75(61.5 %) | 0.067 |
| | Below 65 | Count/percent | 36(4 0.4 %) | 11(33.3%) | 47(38.5 %) | |
| | | Total Count (% within Age) | 89(73 %) | 33(27 %) | 122(100 %) | |

**Table (3): comparison between ages in both groups**

**Table 3 shows that:**
**Group I**: included 36 patients < 65 years (40.4%) and 53 patients>65 years (59.6%).

**Group II**: included 11 patients < 65 years (33.3%) and 22 patients>65 years (66.7%).

There was slight statistical significant difference between patients in both groups as regard age in which AF increase with increase in age (p=0.067) (table 1).

## Relation between Clinical predictors in both groups:

| Clinical Characteristics | Group I sinus | | Group II AF | | Total no. | P value |
|---|---|---|---|---|---|---|
| **IHD** | 26 | 29.2% | 11 | 33.3% | 37(30.3%) | 0.660 |
| **Hypertension** | 32 | 36.0% | 10 | 30.3% | 42(34.4%) | 0.559 |
| **DM** | 12 | 13.5% | 6 | 18.2% | 18(14.7%) | 0.516 |
| **New onset H.F** | 11 | 12.4% | 7 | 21.2% | 18(14.7%) | 0.403 |
| **cigarette Smoking** | 30 | 33.7% | 15 | 45.5% | 45(36.8%) | 0.232 |

**Table (4) Clinical predictors in both groups**

Table (4) and chart (3) show that:

There were 45(36.8%) patients who were cigarette smokers, 37 (30.3%) patients with IHD, 42(34.4%) patient who were hypertensives, 18(14.7%) patients with DM, 18(14.7%) patients with new onset heart failure after implantation of their pacemaker.

***Group I*:** included 26 (29.2%) patients with IHD, 32(36%) patients with hypertension, 12(13.5%) patients with DM, 11(12.4%) patients with new onset H.F and 30(33.7%) who were cigarette smokers.

***Group II*:** included 11(33.3%) patients with IHD, 10(30.3%) patients with HTN, 6(18.2%) patients with DM, 7(21.2%) patients with new onset H.F and 15(45.5%) who were cigarette smokers.

- P value shows that there was no statistical significance among patients in both groups regarding these clinical predictors (table 4).

## Relation between Echocardiographic features of both groups:

| | Group I | Group II | P value |
|---|---|---|---|
| **LV Ejection fraction** | 53.52 ± 11.18 | 55.42 ± 9.88 | 0.210 |
| **LVEDd** | 54.27 ± 7.91 | 58.2 ± 10.12 | 0.605 |
| **Left atrial dimensions** | 36.81 ± 4.52 | | |
| **MR** | | | |

**Table (5) Echocardiographic features of both groups:**

**Table (5) shows that:**

- **Group I:** had a mean LV EF of 53.52% ±11.18%, a mean LV end diastolic dimensions of 54.27 mm ±7.91, and a mean LA dimensions of 36.81 ±4.52.
- **Group II:** had a mean LV EF of 55.42% ±9.88, a mean LV end diastolic dimensions of 58.2 mm ± 10.12, and a mean LA dimensions of 38.09 mm ±5.28.

P value shows that there was no statistical significance among patients in both groups (table 5).

| | | | L A dimension | | |
|---|---|---|---|---|---|
| | | | Below 40 mm | Above 40 mm | Total |
| **Rhythm groups** | Group I | Count(percent) | 62(69.7 %) | 27(30.3 %) | 89(100%) |
| | Group II | Count(percent) | 21(63.6%) | 12(36.4%) | 75(100%) |
| Total Count | | | 83 | 39 | 122 |

**Table (6) Relation between Rhythm and L A dimension**

**Table (6) shows that:**

**Group I**: included 62(69.7 %) patients had normal LA diameter 40 mm or less 27(30.3 %) patients had dilated LA diameter > 40 mm.

**Group II**: included 21(63.6%) patients had normal LA diameter 40 mm or less and 12(36.4%) patients had dilated LA diameter > 40 mm.

**It was found that group II patients had a significantly larger LA size than group I (p=0.034) (table 4).**

## Relation between both groups and pacing parameters:

| **Duration of pacing** | **Group I** | | **Group II** | | **total** | **P value** |
|---|---|---|---|---|---|---|
| | **no.** | **%** | **no.** | **%** | | |
| **Early < 1 yr** | 11 | 12.4% | 2 | 6.1% | 13(11%) | |
| **Intermediate[1-5] yrs** | 63 | 70.7% | 13 | 39.4% | 76(62%) | |
| **Late > 5 yrs** | 15 | 16.9% | 18 | 54.5% | 33(27%) | |
| **Mean duration of pacing** | | | | | | 0.001 |
| **Total** | 89 | 100% | 33 | 100% | 122 | |

**Table (7): Relation between both groups and duration of pacing**

From table (7) and figure (5,6) we see that:

There were 13(11%) patients who were paced for less than 1 year, 11(12.4%) patients in sinus group, 2(6.1%) in AF, 76(62%) patients were paced for a period of 1-5 years, 63(70.7%) patients of them were in sinus rhythm and 13(39.4%) patients in AF, 33(27%) patients were paced for more 5 years, 15(16.9%) patients of them were in sinus rhythm and 18(54.5%) patients with AF.

The mean duration of pacing was ??? for group I and ???for group II.

**It was found that AF is highly significant in patients with prolonged duration of pacing, the longer the duration, the higher the incidence of AF (p=0.001) (table 6).**

**Multivariate analysis of age in relation to duration of pacing:**

| Age Group | | Pacing duration | Rhythm at F.up | | |
|---|---|---|---|---|---|
| | | | AF | Sinus | P value |
| <65 yrs | duration_group | <1yr | 0 | 8 | |
| | | >1yrs and <5yrs | 3 | 25 | |
| | | >5yrs | 2 | 11 | |
| | Total | | 5 | 44 | .523 |
| >65 yrs | duration_group | <1yrs | 1 | 13 | |
| | | >1yrs and <5yrs | 4 | 41 | |
| | | >5yrs | 7 | 15 | |
| | Total | | 12 | 69 | .031 |

A. ***Patients less than 65 years old (49 patients).***

B. ***Group I:*** **included 8 patients (18.2%) paced for less than 1 year, 25 patients (56.8%) paced for more than 1 and less than 5 years and 11 patients (25%) paced for more than 5 years.**

***Group II:*** **included no patients (0%) paced for less than 1 year, 3 patients (60%) paced for more than 1 and less than 5 years and 2 patients (40%) paced for more than 5 years.**

**(P=0.523)**

**C. *Patients more than 65 years old (81patients).* *Group I:* included 13 patients (18.8%) paced for less than 1 year, 41 patients (59.4%) paced for more than 1 and less than 5 years and 15 patients (21.7%) paced for more than 5 years.**

***Group II:*** **included 1 patient (8.3%) paced for less than 1 year, 4 patients (33.3%) paced for more than 1 and less than 5 years and 7 patients (58.3%) paced for more than 5 years.**

**(P=0.031)**

**It was found that the age factor does not maintain the relation between the duration of pacing and incidence of AF. The longer the duration of pacing, the higher the incidence of AF only in patients older than 65 years**

| **Site of pacing** | **Group I** | | **Group II** | | **Total** | **P value** |
|---|---|---|---|---|---|---|
| RV apex | 65 | 73% | 27 | 81.8% | 92 | |
| RVOT | 24 | 27% | 6 | 18.2% | 30 | |
| **Total** | 89 | 100% | 33 | 100% | 122 | |
| **Expected battery life** (mean / SD) | 8.8 ± 3.1 | | 5.65 ± 2.8 | | | **0.02** |

**Table (7) Relation between pacer parameters in both groups.**

***Table (7) shows that:***

***Group I*****:** included 65 patients (73%) with the site of pacing being RV apex, and 24 patients (27%) being paced from RVOT, the mean expectant battery life was 8.8±3.1 years.

***Group II*****:** included 27 patients (81.8%) with the site of pacing being RV apex, and 6 patients (18.2%) being paced from RVOT, the mean expectant battery life was 5.65 ± 2.8 years.

P value shows that there was no statistical significance among patients in both groups regarding the site of pacing, there were a statistical significance regarding the battery life in which patients with AF are associated with less battery life, p=0.02 (table 7).

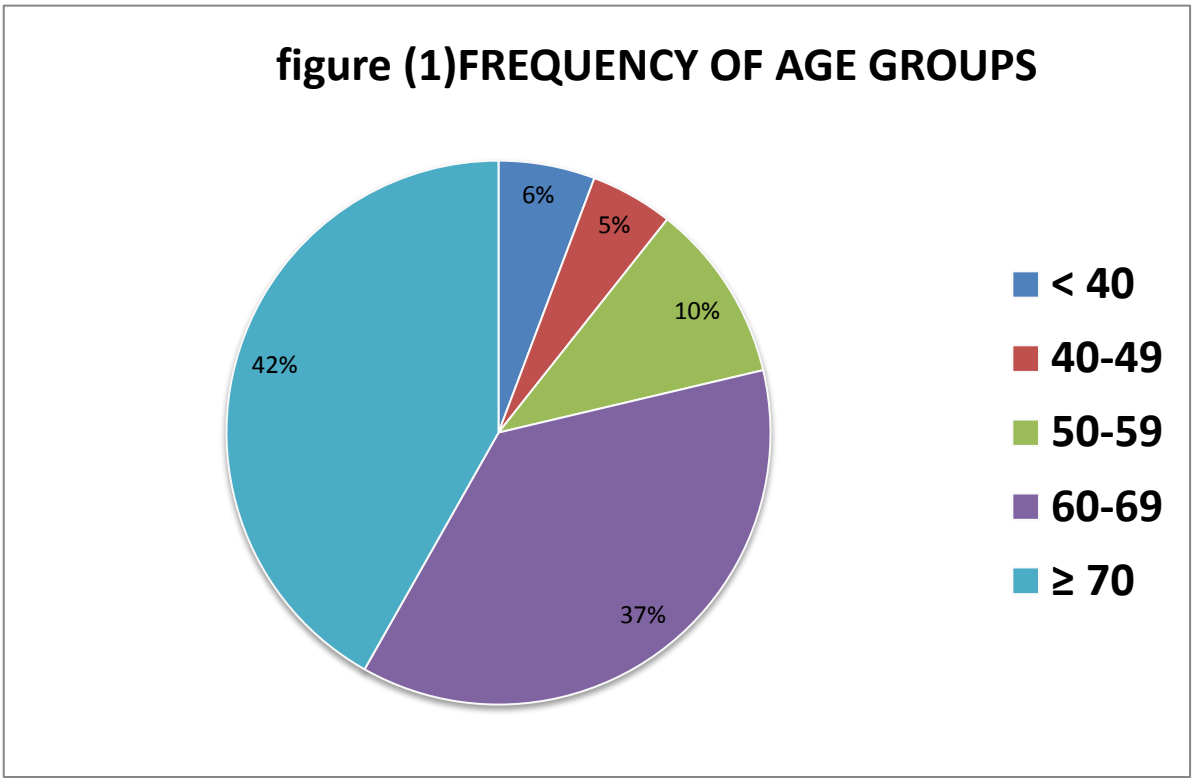
**Table (7): Correlation between group II (patients with AF at follow up) and anticoagulation:**

| | Anticoagulation | No anticoagulation | P value |
|---|---|---|---|
| **Group I** | **3(9%)** | **30(91%)** | |

Only 3 (9 %) patients who had AF was anticoagulated. 25 out of 33 patients met the high risk criteria for throboembolism, and there was nothing denoting contraindication to anticoagulant either by history or in their medical records.

# Master table

| *Demographic charac.* | | Group I | | Group II | | P Value |
|---|---|---|---|---|---|---|
| **Age (mean) / St. dev.** | | 65.9 | ± 11 | 66.4 | ± 14 | **0.067** |
| **Sex (%) M / F** | | 50.6% | 49.4% | 48.5% | 51.5% | 0.838 |
| **Clinical predictors** | | | | | | |
| **I.H.D.** count / percent. | | 26 | 29.2% | 11 | 33.3% | 0.660 |
| **HTN** count / percent | | 32 | 36.0% | 10 | 30.3% | 0.559 |
| **DM** count / percent | | 12 | 13.5% | 6 | 18.2% | 0.516 |
| **H.F.** count / percent | | 11 | 12.4% | 7 | 21.2% | 0.403 |
| **Special habits:**<br>**Current Smoking** | | 30 | 33.7% | 15 | 45.5% | 0.232 |
| **Echocardiographic features** | | | | | | |
| **LV. E.F.** mean/ St. dev | | 53.52 | ± 11.18 | 55.42 | ± 9.88 | 0.210 |
| **LV.D.D.** mean/ St. dev | | 54.27 | ± 7.91 | 58.2 | ± 10.12 | 0.605 |
| **LA.Dim.** mean/ St. dev | | 36.81 | ± 4.52 | 38.09 | ± 5.28 | **0.074** |
| **Pacing data** | | | | | | |
| **Duration of pacing** | **< 1yr** | 11 | 12.4% | 2 | 6.1% | **0.001** |
| | **1-5yrs** | 63 | 70.7% | 13 | 39.4% | |
| | **> 5yrs** | 15 | 16.9% | 18 | 54.5% | |
| **Site of pacing** | RV apex | 65 | 73% | 27 | 81.8% | 0.800 |
| | RVOT | 24 | 27% | 6 | 18.2% | |
| Expected battery life mean/ St. dev | | 8.8 | ± 3.1 | 5.65 | ± 2.8 | **0.020** |



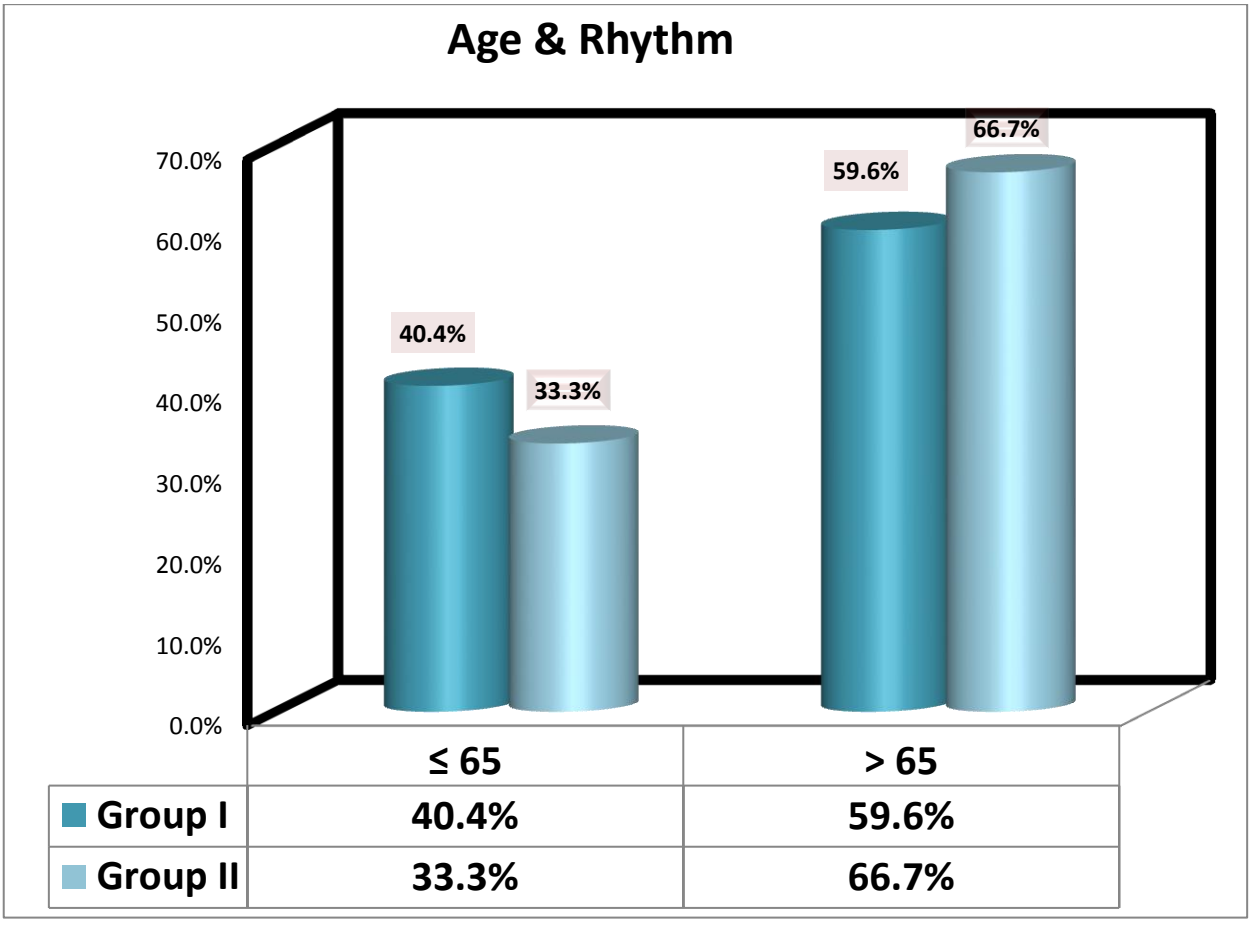




**Figure (2) Distribution of age in both groups**

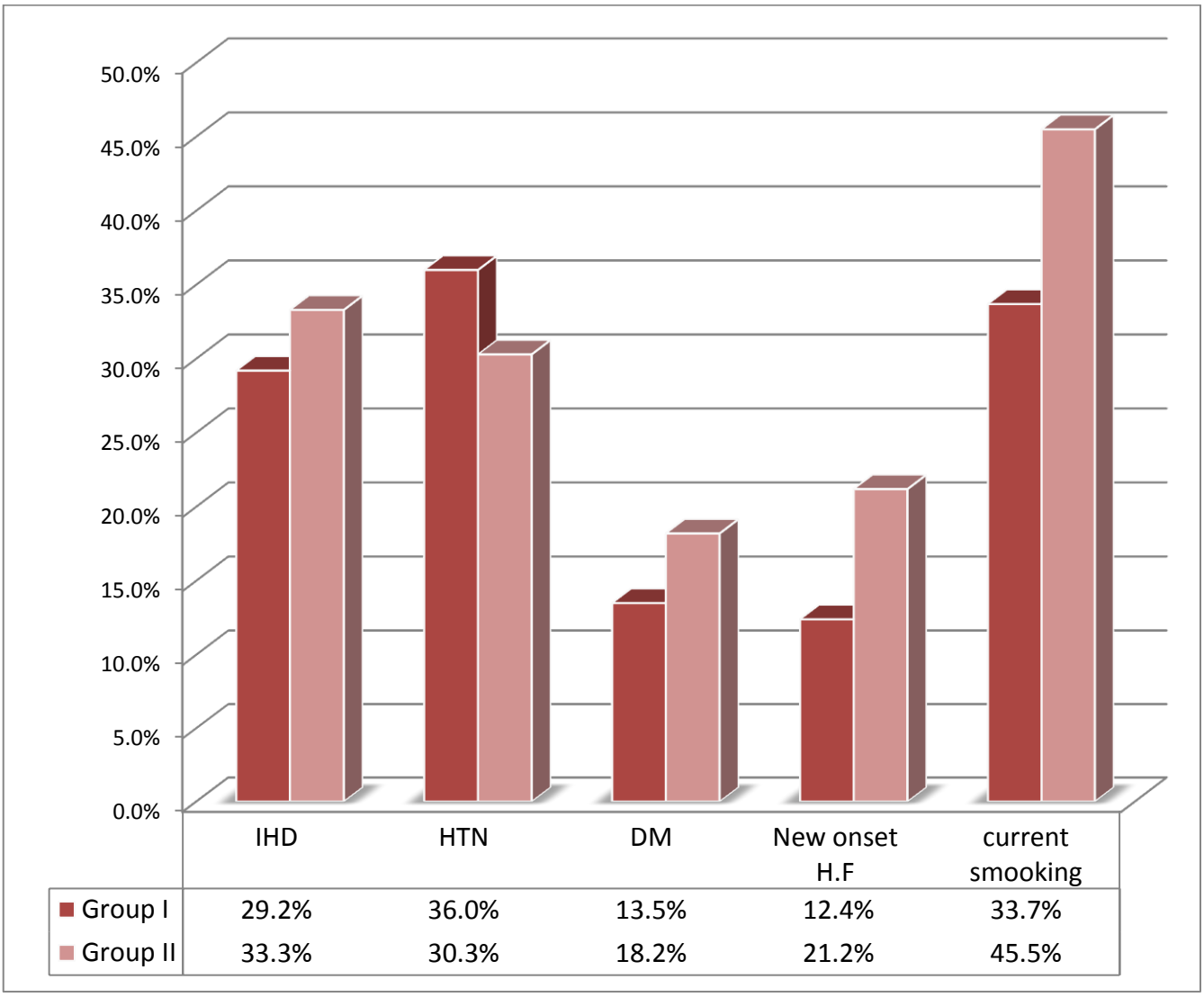
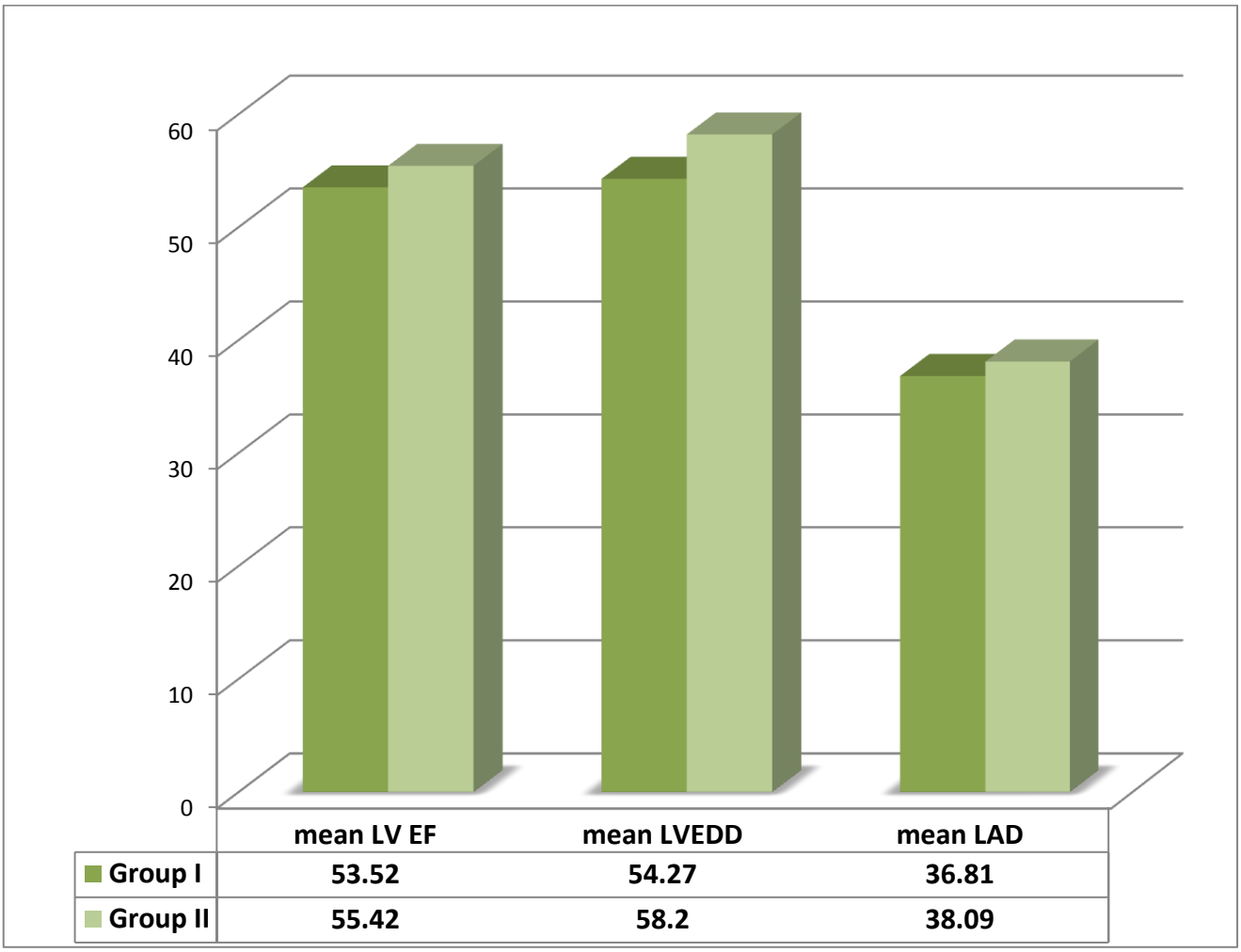



**Figure (3): Percentage of clinical Predictors in both groups**




| | mean LV EF | mean LVEDD | mean LAD |
|---|---|---|---|
| Group I | 53.52 | 54.27 | 36.81 |
| Group II | 55.42 | 58.2 | 38.09 |

**figure (4) Echocardiographic features of both groups**

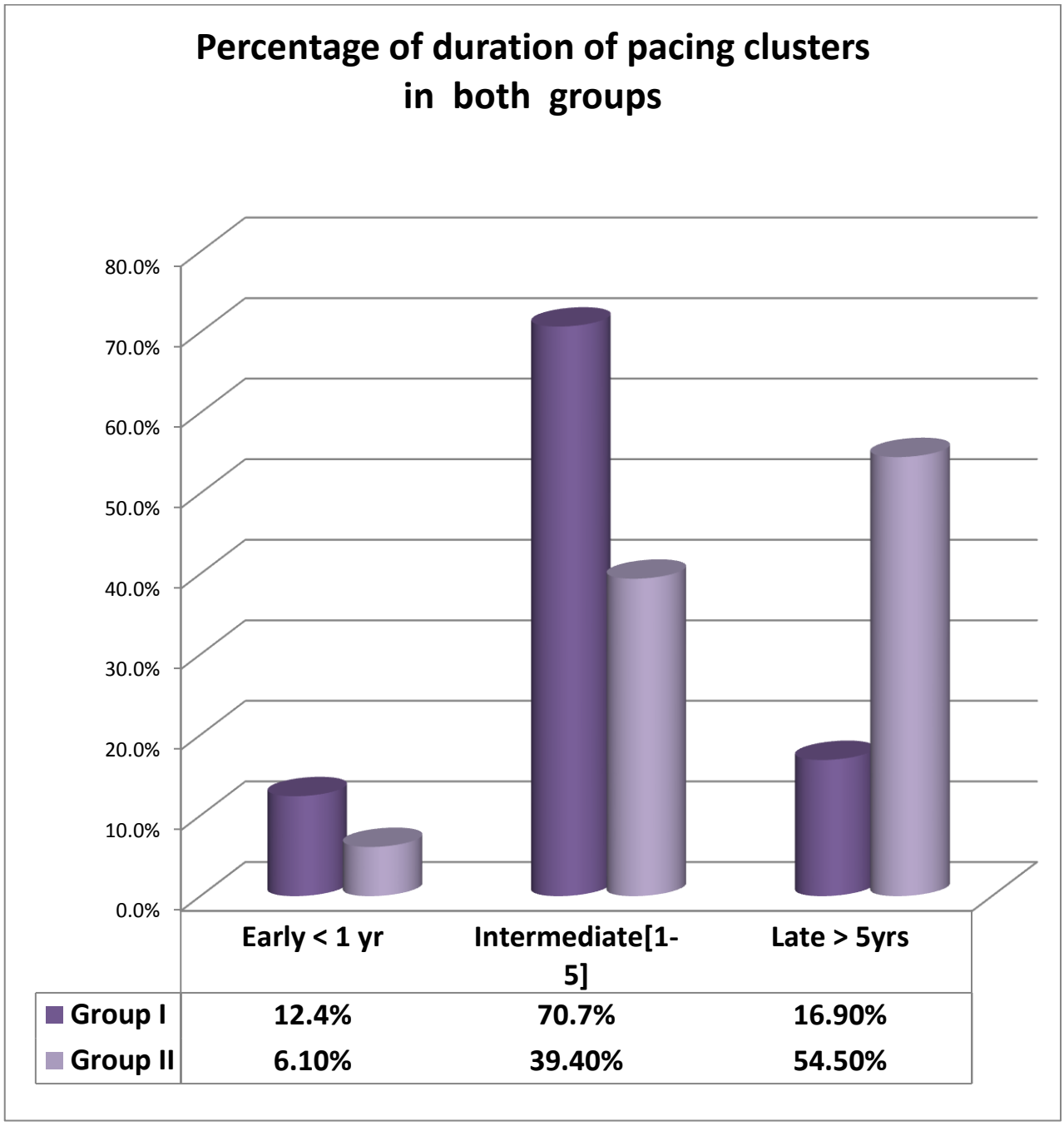



***Figure (5): Duration of pacing groups divided into early, intermediate and late.***

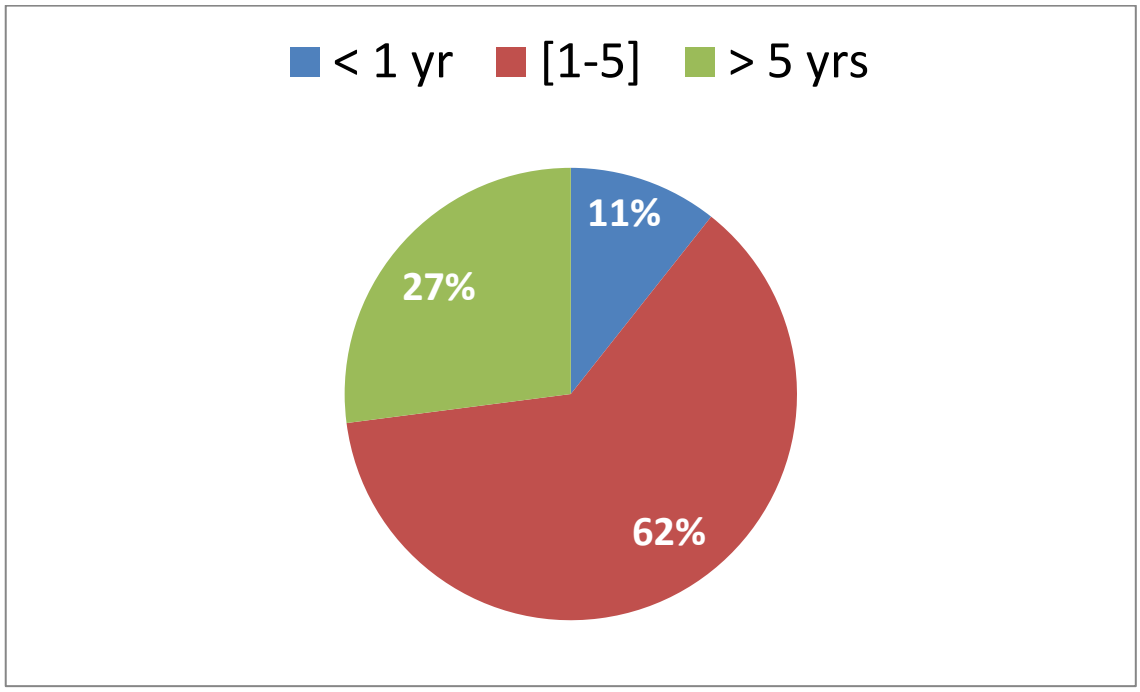



**Figure (6)** Percent distribution according to pacing duration groups.

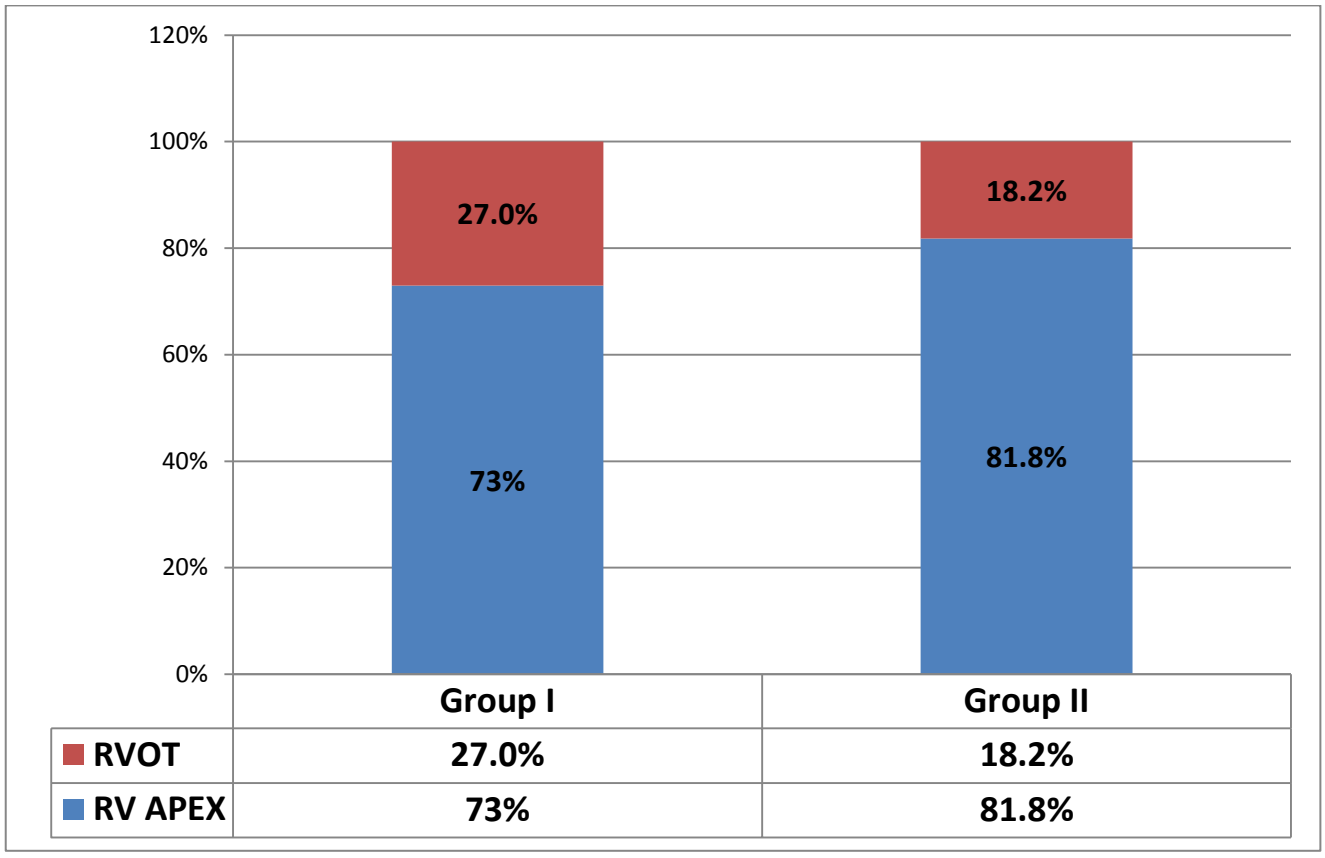



**figure (7) Relation between Site of pacing in both groups**