The outcomes of ambulatory electrocardiography (AECG or Holter) performed for patients with symptoms related to cardiac arrhythmia in the primary care: a case series report

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Does this patient with Palpitation/Dizziness/Presyncope/Syncope … have a cardiac arrhythmia?

- Non-specific, very common, with wide differential diagnosis
- ***Palpitation:*** 16% in general medical outpatients
- Cardiac (43%), psychiatric (31%), miscellaneous (10%) and unknown in 16%.
- ***Dizziness:*** 1% of the population consult a general practitioner each year for this symptom.
- ***Syncope:*** 3-5% of all emergency department visits and 1-3% of hospitalizations.

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Benign and Self limiting or
Important abnormalities of cardiac rhythm or conduction

- Majority of patients require further investigation
- 24 Hrs Holter monitoring is widely used and remains the first line-investigation in many cardiac centers for evaluating palpitations and altered consciousness.

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Ambulatory Electrocardiography (AECG or Holter)

- a dedicated portable recorder registers the ECG continuously during a prolonged period, usually 24 hours.
- allows diagnosis of transient disturbances of cardiac rhythm and conduction.

- Mr. Norman Jefferis Holter

Ambulatory Electrocardiography (AECG or Holter)

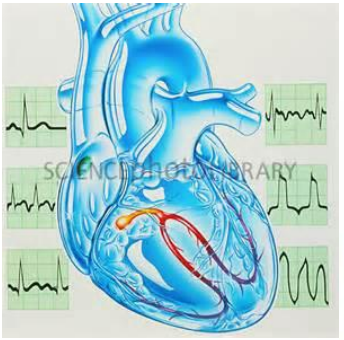
- The main indication, which include unexplained recurrent palpitation, unexplained syncope, near syncope, or episodic dizziness in which the cause is not obvious.

- American Heart Association and American College of Cardiology (ACC/AHA).

- Philips Zymed Digitrak Plus

Using Ambulatory Electrocardiography (AECG or Holter) in Primary Care

- aiming for early detection of possible life-threatening cardiac arrhythmia as a cause of symptoms.
- It can minimize the patient risk by shortening the time to diagnosis and initiate appropriate early referring to specialist care.



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The outcomes of ambulatory electrocardiography (AECG or Holter) performed for patients with symptoms related to cardiac arrhythmia in the primary care: a case series report

- Objectives:
- To delineate the presenting symptoms of patients indicated for Holter monitoring;
- To examine outcomes of the Holter monitoring;
- To find predictive patient characteristics associated with significant cardiac arrhythmia.

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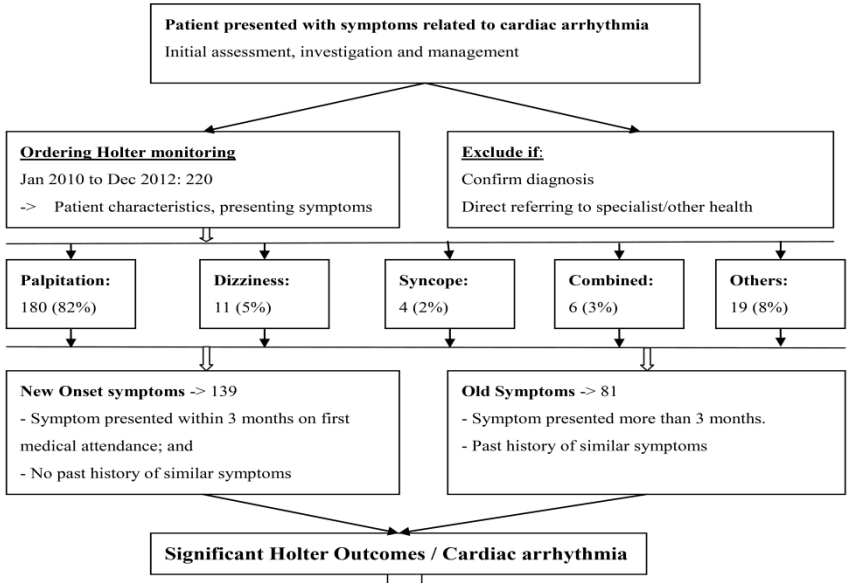
Methodology: Study Flowchart



	New	Old	Overall
SVE/VE (Freq)	11	11	22
Long QT syndrome	5	8	13
SVE/VE (Bi/Tri)	8	5	13
AF/PAF	6	6	12
PSVT	8	1	9
Brady/Tachy	5	3	8
SSS	3	2	5
HB (2^0 or 3^0)	2	1	3
ST change	2	1	3
Total	50	38	88

Results: Patient demographics

Table 1: The demographic characteristics of patients:

	Frequency	% of Total
Male	65	29.5%
Female	155	70.5%
Age distribution: </= 40	21	9.5%
41 – 60	90	41.0%
>60	109	49.5%
Associated comorbidity:	139	63.2%
Hypertension	(94)	n/a
Diabetes Mellitus	(24)	n/a
IFG / IGT	(12)	n/a
Dyslipidaemia	(38)	n/a
Ischaemic heart disease	(7)	n/a
Congestive heart failure	(1)	n/a
Cerebral vascular accident	(5)	n/a
Transient ischemic attack	(2)	n/a
No associated chronic disease	81	36.8%
Total:	220	100%

IFG / IGT: impaired fasting glucose / impaired glucose tolerance

Note: patients may have more than one comorbidity.

Results:

Table 2: Presenting symptoms of patients indicated for Holter monitoring

Symptoms	No of cases	Percentage
1. Palpitation	180	82%
2. Dizziness	11	5%
3. Syncope / Presyncope / Loss of consciousness	4	2%
4. Combines symptoms	6	3%
5. Others, such as chest pain, incidental abnormal ECG findings, Follow up assessment etc	19	8%
Total	220	100%

Results:

Table 3: Significant cardiac arrhythmia stratified by presenting symptoms

	Frequency of significant Holter findings					
	Palpitation	**Dizziness**	**Syncope**	**Combined**	**Others**	**Overall**
SVE/VE (Freq)	18	1	0	0	3	**22 (25%)**
Prolong QT	11	0	1	1	0	**13 (15%)**
SVE/VE (Bi/Tri)	11	0	0	0	2	**13 (15%**
AF/PAF	10	0	0	2	0	**12 (14%)**
PSVT	8	0	0	0	1	**9 (10%)**
Brady/Tachy	5	1	0	0	2	**8 (9%)**
SSS	3	0	1	1	0	**5 (6%)**
HB (2^o or 3^o)	1	1	0	0	1	**3 (3%)**
ST change	2	0	0	0	1	**3 (3%)**
Total	69	3	2	4	10	**88 (100%)**

Results:

Table 4: Significant cardiac arrhythmia stratified by new or old presenting symptoms

	Frequency of significant Holter findings		
	New Onset: 139	Old presentation: 81	**Overall: 220**
SVE/VE (Freq)	11	11	**22 (25%)**
Prolong QT	5	8	**13 (15%)**
SVE/VE (Bi/Tri)	8	5	**13 (15%**
AF/PAF	6	6	**12 (14%)**
PSVT	8	1	**9 (10%)**
Brady/Tachy	5	3	**8 (9%)**
SSS	3	2	**5 (6%)**
HB (2^0 or 3^0)	2	1	**3 (3%)**
ST change	2	1	**3 (3%)**
Total	**50 (57%)**	**38 (43%)**	**88 (100%)**

Results:

Table 5: Predictive patient characteristics with significant Holter outcomes:

DM /IFG /IGT: Diabetes mellitus /Impaired fasting glucose /Impaired glucose tolerance
CVA /TIA: Cerebral vascular accident / Transient ischemic attack
Note: patients may have more than one comorbidity.

	Frequency	Significant Cardiac arrhythmia	Chi-square p-value	Likelihood ratio
Male	65	34	0.016	5.76
Female	155	54		
Age distribution: </= 40	21	8		
41– 60	90	21		
>60	109	59	0.000	19.05
Associated comorbidity:	139	64	0.017	5.08
Hypertension	(94)	(46)	0.004	8.37
DM /IFG /IGT	(36)	(20)	0.037	4.25
Dyslipidaemia	(38)	(19)	0.167	1.88
Ischaemic heart disease	(7)	(6)	0.005	8.11
Congestive heart failure	(1)	(0)	n/a	n/a
CVA /TIA	(7)	(5)	0.085	2.93
No associated chronic disease	81	24		

Summary of Holter Outcomes: Five leading findings for all patients

	Significant Holter findings	Percentage
1	Frequent supraventricular / ventricular ectopics	**25%**
2	Long QT syndrome	**15%**
3	Supravenbricular / ventricular ectopics in bigeminy or trigeminy	**15%**
4	Paroxysmal atrial fibrillation	**14%**
5	Paroxysmal supraventricular tachycardia	**10%**

Summary of Holter Outcomes:
Five leading findings for patients with palpitation

	Significant Holter findings	Percentage
1	Frequent supraventricular / ventricular ectopics	**22%**
2	Supraventricular / ventricular ectopics in bigeminy or trigeminy	**19%**
3	Paroxysmal supraventricular tachycardia	**19%**
4	Paroxysmal atrial fibrillation	**14%**
5	Long QT syndrome	**10%**

Outcomes of other Studies of Holter Monitoring

Author	Setting	Presenting Symptoms	Significant Cardiac arrhythmia
Chu CKK	AED, Hong Kong	Syncope: 51% Dizziness: 12% Palpitation: 15%	**Overall: 19.5%**
Yue CS	Cardiology Hong Kong	Syncope / Dizzy spell: 37%	**17.4%**
Chan WK	Medical Hong Kong	Palpitation: 47% Syncope: 27% Dizziness: 10%	**Overall: 6.3%**
Summerton N	General practice UK	Palpitation: 100%	**19%**
Sreekumar S	Hospital UK	Altered consciousness:41.7% Palpitation: 36.2%	**15.8%** **16.4%**
Kuhne M	Cardiology Switzerland	Syncope: 17%	**Syncope related: 8.6%** **Overall: 13.6%**

Limitations & Implications

- Patients from one primary care clinic, uncertain whether represent patients of primary care setting or not?
- Not including all patients with indicated presenting symptoms.

- High diagnostic yield.
- Enabled an early detection of cardiac arrhythmia, including serious arrhythmia and speeded up their management.

Conclusion:

- ***40%*** of Holter monitoring for patients in the primary care have significant cardiac arrhythmia.
- ***34%*** of Holter monitoring for patients with *newly onset palpitation* in the primary care have significant cardiac arrhythmia

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Thanks!

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