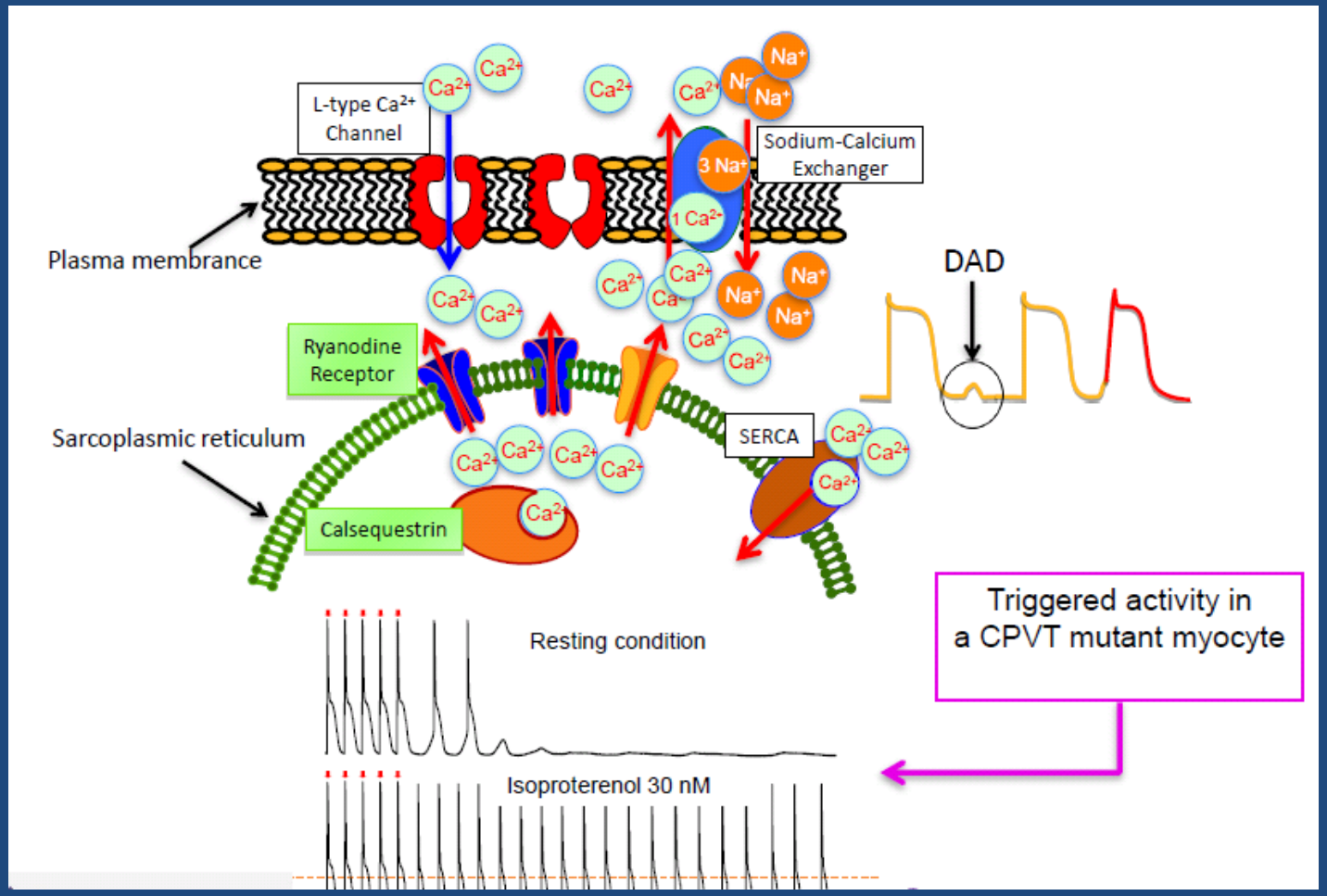
Electrocardiographic comparison of ventricular premature complexes during stress test in patients with catecholaminergic polymorphic ventricular tachycardia and healthy subjects.

Miry Blich[1], Asaad Khoury[2], Ibrahim Marai[1], Mahmoud Suleiman[1], Avraham Lorber[2], Lior Gepstein[1], Monther Boulous [1]

[1]Division of Pacing and Electrophysiology,[2] Department of Pediatric Cardiology

Rambam Health Care Campus and Bruce Rappaport Faculty of Medicine, Haifa, Israel

CPVT: Mechanism of delayed afterdepolarization and triggered activity



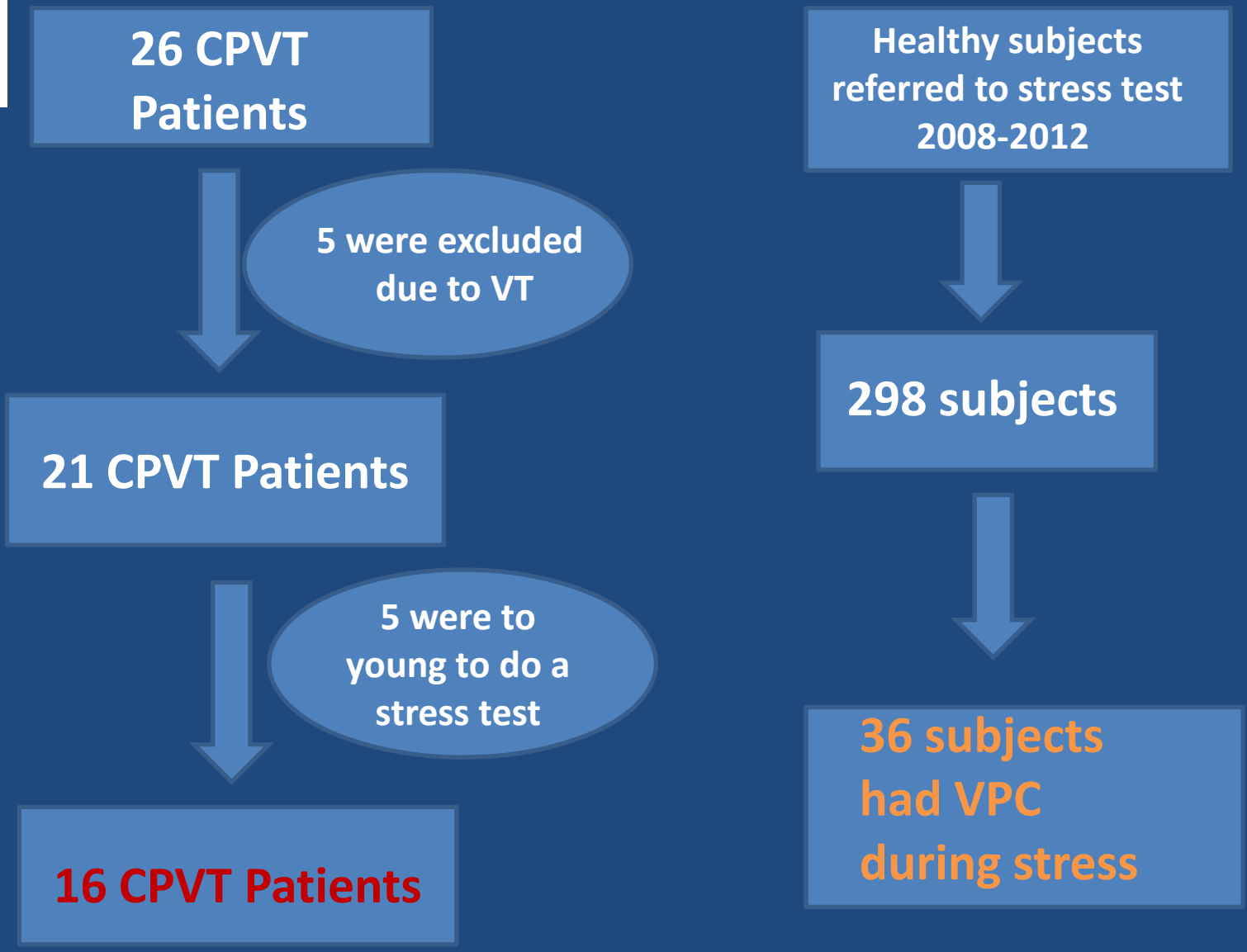
Introduction

- Diagnosis and therapy of CPVT can save life and prevent SCD
- Although exercise stress test is the most reliable way to diagnose CPVT
- In 30% only single ventricular premature complexes (VPC'S) were recorded.
- VPC'S occur up to 5% of healthy subjects

Objective

- To evaluate whether electrocardiographic characteristics of ventricular premature complexes (VPC'S) during stress test distinguish patients with catecholaminergic polymirphic ventricular tachycardia (CPVT) from healthy subjects.

Methods


26 CPVT Patients
5 were excluded due to VT
21 CPVT Patients
5 were to young to do a stress test
16 CPVT Patients
Healthy subjects referred to stress test 2008-2012
298 subjects
36 subjects had VPC during stress

Results: baseline characteristics

	CPVT n= 16	Control n = 36	p
Age	15 ± 5	37 ± 10	< 0.0001
Male	7 (44%)	34 (94%)	< 0.0001
Propranolol treatment	13 (81%)	0 (0%)	< 0.0001
Verapamil treatment	4 (25%)	0 (0%)	0.006

Results: PVC number

	CPVT n= 16	Control n = 36	p
Total number	30 ± 14	3 ± 4.2	< 0.0001
Number at maximum HR	7 ± 14	0.8 ± 0.7	< 0.0001
Bigeminy or trigeminy	13 (81%)	0 (0%)	< 0.0001
Bigeminy or trigeminy at maximum HR	12 (75%)	0 (0%)	< 0.0001
Couplet	6 (37%)	1 (3%)	0.002

Results: PVC timing

	CPVT n= 16	Control n = 36	p
Work level for first VPC (METS)	12.5 ± 5	6.5 ± 6	0.0007
First VPC in the recovery	0 (0%)	15 (42%)	0.001
Last VPC after 1 min in the recovery	0 (0%)	13 (36%)	0.004

Results: PVC morphology

	CPVT n= 16	Control n = 36	p
LBBB pattern	15 (94%)	14 (39%)	0.0007
LBBB pattern and inf axis	14 (88%)	0 (0%)	< 0.0001
QRS duration (msec)	139 ± 18	121± 21	0.004
Coupling interval (msec)	476 ± 58	355 ± 61	< 0.0001

The most sensitive characteristics for the detection of CPVT

	Sensitivity	NPV
PVC burden (> 10/test)	100%	100%
LBBB pattern + inf axis	88%	94%
Coupling interval > 400 msec	88%	94%

The most specific characteristics for the detection of healthy subjects

	Specificity	PPV
First VPC in the recovery	100%	100%
VPC more than 1 min in the recovery	100%	100%

Conclusions

- High PVC burden >10/test
- First PVC at high work level and not in the recovery
- Bigeminy or trigeminy during the peak stress
- LBBB pattern+ inf axis
- QRS> 120 msec
- Coupling interval > 400 msec
- Last PVC not later than one min in the recovery

Suspect CPVT!