ICDS FROM THE PATIENT’S PERSPECTIVE

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Objectives

- Understand basic indications for ICD placement
- Describe possible complications related to ICDs
- State psychological disturbances associated with ICDs
- Explain treatment options for psychological disturbances seen in ICD patients
History of ICDs

Developed by Michel Mirowski, MD

Initially, patients must survive cardiac arrest not caused by an MI twice.
Early generators took 400 hours to build by hand!

The original implants were done with thoracotomy approach and consisted of patches on the epicardium.
Basic ICD Function
Intervals

- In Electrophysiology we work with intervals which is also known as cycle length.
- To convert beats per minute to intervals in milliseconds you can count the “boxes” or:

\[
\frac{60,000}{60 \text{ bpm}} = 1,000 \text{ ms} \quad \frac{60,000}{70 \text{ bpm}} = 857 \text{ ms}
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\[
\frac{60,000}{80 \text{ bpm}} = 750 \text{ ms} \quad \frac{60,000}{100 \text{ bpm}} = 600 \text{ ms}
\]
Primary prevention
- Ischemic cardiomyopathy with EF \(<30\%\), more than 40 days post MI or more than 90 days post revascularization
- LVEF \(<35\%\), NYHA class II or III
- LVEF \(<40\%\) due to prior MI, inducible VT or VF at EPS

Secondary prevention
- Survived sudden cardiac arrest due to VT or VF
Number Needed to Treat

\[ \text{NNT}_{x \text{ years}} = \frac{100}{(\% \text{ Mortality in Control Group} - \% \text{ Mortality in Treatment Group})} \]
Appropriate Therapy
Appropriate Therapy
Inappropriate therapy

ATP therapy
Inappropriate therapy
Inappropriate therapy
Inappropriate therapy
Inappropriate therapy
Inappropriate therapy
Complications

Figure 1: A fluoroscopic image of externalized conductor defect in a St. Jude Medical Riata defibrillator lead.

Guidant recalls heart defibrillators
More than 58,000 implanted devices could malfunction

Impact of Imprinted Recalled Sprint Fidelis Lead on Patient Mortality

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Psychological Impact

- Wide range of rates
  - Anxiety 13-63%
  - Depression 5-41%
- No difference in those implanted for primary vs secondary prevention
- Inconsistent results reported in studies regarding impact of shocks. Decreased QOL with ≥ 5 shocks
- Decreased psychological distress over time in some reports.
Psychological Impact

- Anxiety at baseline often continues post-implant.
- Type D personality, diabetes, and the need for cardiac resynchronization have been found to be statistically significant predictors of anxiety specifically.
- Younger age, women, other comorbid conditions, and lack of social support are also factors that increase the risk of psychological distress.
- Arrhythmias can be potentiated by anxiety.
Psychological Impact

- Device recalls
  - Patients appreciate frank in person discussion on issue
  - Alert patient of the possibility *prior* to implant
  - Most can tolerate and accept the information
  - More distress if the recall results in an inappropriate shock
- Inappropriate shocks and VT storm are also anxiety producing
- A single appropriate shock sometimes increased security
Post traumatic stress disorder is also an issue in cardiac patients.

~20% prevalence depending on study

Increased risk if a survivor of out of hospital arrest.

Studies differ on whether this improves or worsens over time

May manifest as ‘phantom shock’

Better described as “Post-ICD shock reaction”
Psychoeducational Interventions

- Generally help more with anxiety than depression
- Goal is to increase knowledge and teach coping skills
  - Cognitive behavioral therapy
  - Support groups—no concrete evidence for or against, likely due to small sample sizes and study design.
  - Cardiac rehab/exercise—mixed results in the three studies completed.
Sears et al recommend a step wise approach
  - ID patients based on risk factors
  - Screen and refer
  - Optimize medications and programming

Cognitive behavioral therapy to prepare the patient on a shock plan has demonstrated some effectiveness.

Pharmacological measures have low response rates
Final Thoughts

- Thorough discussion of risks and benefits prior to implant should include:
  - possibility of device recall
  - future procedures in the case of erosion or infection
  - appropriate versus inappropriate shocks
  - inability of the ICD to increase QOL
- Identify those at risk early on after implantation
- At each device visit, assess whether referral to psych is appropriate
ICDs and their indications have come a long way since the first implant in the 1980’s

Remember to address the whole person as many patients may not want to admit they need emotional help

Allow time for discussion regarding the device and plans in case of a shock
Questions
References

- Baura, G. (2012). Chapter 5-Implantable cardioverter defibrillators. In Medical device technologies (pp. 103-120). http://dx.doi.org/10.1016/B978-0-12-374976-5.00005-0