

Bölüm 30

BİYOLOJİK PİLLER

Ramazan GÜNDÜZ'

GİRİŞ

Tarihçe

İlk portable eksternal pacemaker Lidwel ve Hyman tarafından geliştirilmiştir. [1], [2] Bu araştırmacıların geliştirdiği cihaz sayesinde ilk defa bir yeni doğanın kalbini 10 dakika pace ettikten sonra , yenidoğanın kendi kalp atımları başladı ve yenidoğan hayatta kaldı.Ardından 1958 de ilk başarılı implantasyon epikardial leadler kullanılarak 1958 de Elmqvist ve Senning tarafından gerçekleştirildi.[3] Eş zamanlı olarak Furman ve arkadaşları transvenöz yoldan kalbi ilk defa pace ettiler.[4] 1960 lı yıllarda kalıcı transvenöz endokardial pacing ve spesifik pacing modları(ventrikül inhibe edici,ventrikül tetikleyici protokoller) gelişti.[5] 1970 li yıllarda pacemaker lead fiksasyonu,titanium jeneratör ve lityum iyodin bazlı güç kaynakları kullanılmaya başlandı.1980 lerde ise iki odacıklı, hız adaptif(aktivite ve solunum sensörleri ile) gibi daha fizyolojik sistemler geliştirildi.[6]

Elektronik pacemaker teknolojisindeki hızlı gelişime rağmen bu pillerin lead kırılması yada disloke olması, enfeksiyon, kısıtlı batarya ömrü, suboptimal otomatik yanıtızlık gibi dezavantajları vardır.Bu kısıtlıkların üstesinden gelmek için leadsiz pacemaker ve dışardan şarj teknolojileri üzerinde çalışılmaktadır. Bu kısıtlıkları aşmak için bir diğer alanda biyolojik pacemakerlardır.

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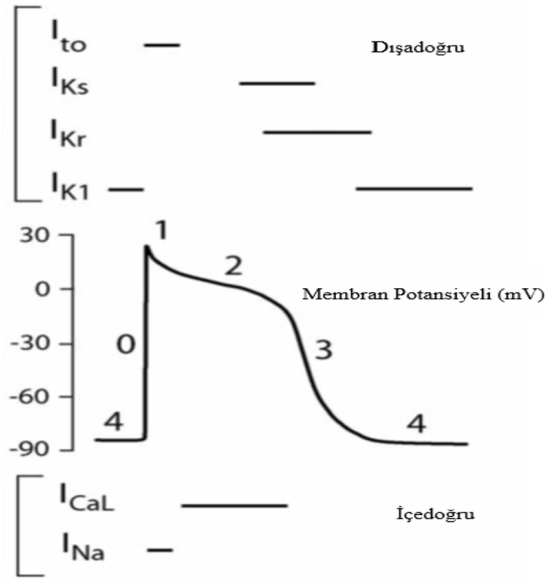
SONUÇ

Biyolojik piller hücre ve gen yaklaşımı konusunda çok önemli bilgiler sağladı. Bunların pil dışındaki kardiak alanlarda da kullanımı olacaktır. Biyolojik piller hayvan çalışmalarında kalp pili işlevini sağlamıştır. Bu konudaki gelişmenin hızı da düşünülecek olursa bunların uzun dönemde insanlarda elektronik pillere alternatif olabileceğini söyleyebiliriz.

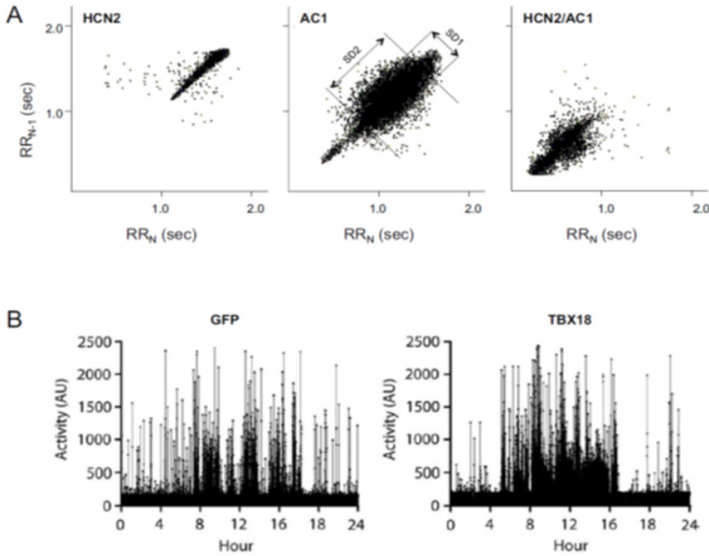
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Şekil 1. B Ventrikül miyosit aksiyon potansiyeli (Boink GJ, Christoffels VM, Robinson RB, Tan HL. The past, present, and future of pacemaker therapies. Trends in cardiovascular medicine. 2015;25(8):661-73)[34]



Şekil 2. Mekanizma bazında tüm stratejiler (Boink GJ, Christoffels VM, Robinson RB, Tan HL. The past, present, and future of pacemaker therapies. Trends in cardiovascular medicine. 2015;25(8):661-73) (34)