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研究課題名(和文) 加算微分心電図を用いた分裂性QRSとJ波の定量化による心臓突然死リスクの予測法

研究課題名(英文) Risk prediction for sudden cardiac death by quantitative analysis of fragmented QRS and J wave using differentiation of signal addition

研究代表者

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研究成果の概要(和文)：分裂性QRS(fQRS)は障害心筋・線維化による心室内興奮伝播が様々な方向に変化していることを示しており、不整脈発生の基質や心機能障害の推測に有用である。またJ波は心臓興奮後の再分極早期の電位異常を示しており、致死的不整脈発生に結び付くと考えられる。fQRSやJ波がさまざまな心室頻拍・細動発生にどのように関わるかを検討し、欧米・アジア太平洋の不整脈学会誌のJ波症候群専門家会議報告や日本循環器学会遺伝性不整脈ガイドラインに成果が取り入れられた。

研究成果の概要(英文)：Fragmented QRS (fQRS) represents intraventricular conduction abnormality due to myocardial injury and fibrosis. fQRS will result in arrhythmogenic substrate and cardiac dysfunction. J wave is also electrophysiological abnormality that can promote lethal arrhythmias. We have evaluated existence of fQRS and J wave in various heart diseases. Our published data were adopted for "J-wave syndromes expert consensus conference report" endorsed by APHRS, EHRA, HRS and SOLAECE and "Guidelines for diagnosis and management of inherited arrhythmias; JCS 2017" by Japanese Circulation Society.

研究分野：心臓突然死を来す遺伝性不整脈、重症不整脈、心筋症などを中心に研究を行っている。

キーワード：心臓性突然死 致死的不整脈 遺伝性不整脈 QRS棘波 早期再分極 J波

1. 研究開始当初の背景

突然死の原因として、心筋梗塞、心筋症などの器質的心疾患や、器質的異常を伴わない特発性心室細動や遺伝性不整脈まで、様々な疾患が含まれる。リスク評価の指標として用いられる運動負荷、心エコー、加算平均心電図、カテーテル検査等は、特定の疾患では有用であっても、他の疾患ではリスク評価が出来ないことも多い。このため、我々は12誘導心電図で評価可能な新しい指標である分裂性QRS電位(fQRS)とJ波の心疾患の予後予測における意義を検討してきた。

2. 研究の目的

当研究では、fQRS波とJ波を定量化し組み合わせることで、予後との関連(突然死、死亡率、重症不整脈、心不全などの発生)、また他の指標(一般心電図指標や加算平均心電図)と予測因子としての優劣を判定し、心臓性突然死のリスク評価、予後予測法の開発を目的とした。

3. 研究の方法

様々な心疾患で、古典的なリスク評価法と加算微分法による分裂性QRS・J波解析の各データと、致死的不整脈・心不全発生との関連性を検討した。

4. 研究成果

J波及び早期再分極波がさまざまな心室頻拍・細動発生にどのように関わるかを検討し、Shanghaiで開催された"Expert Consensus Conference on J Wave Syndromes"での招待講演で報告し、欧州・米国・アジア環太平洋・南アメリカの各不整脈学会誌にExpert Consensus Conference Reportとして掲載された。また、発熱時にのみ出現する著明なBrugada型J-ST上昇の臨床的意義を検討し、元々不整脈の症状を有さない症例でも年間0.9%の心室細動・突然死の発生が起こることを報告した(Heart Rhythm 2016)。Brugada症候群ではfQRSの存在が心室細動などの心事故発生と関連することは以前報告したが、fQRSの存在部位がJ点上昇が見られる心電図誘導のみならず、下側壁誘導などの他の誘導で広く見られる場合、J波が存在する場合よりも予後が悪いことを報告した(Circ AE 2017)。また無症候性患者からの初発心室細動と有症候性患者での心室細動再発ではリスク予測因子が異なることを報告した(J Cardiovasc Electrophysiol 2018)。これらの研究は、日本循環器学会遺伝性不整脈に関するガイドライン(2017年改訂版)に盛り込まれている(協力員として分担執筆)。

5. 主な発表論文等

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〔図書〕(計 2 件)

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〔産業財産権〕

出願状況 (計 0 件)

取得状況 (計 0 件)

〔その他〕

ホームページ等

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