**INTRODUCTION**

The 12 lead electrocardiogram (ECG) is a diagnostic tool that aids in the evaluation of coronary artery disease (CAD). Unlike other 11 leads, lead augmented Vector right (aVR) has been long neglected until recent years. Recent investigations have shown that an analysis of ST-elevation (STE) in lead aVR greater than or equal to 1mm, regardless of infarct location, had a higher 30-day mortality rate. Those with an anterior MI and STE in aVR had a 15.5% mortality rate compared to those without aVR at 12.7%. P=0.0069. Those with an inferior MI had a 15.9% mortality rate compared to 6.5% without aVR involvement. This led to the conclusion that STE in lead aVR provides important information on prognosis after an acute myocardial infarction.

**Study 1: aVR ST elevation: an important but neglected sign in ST elevation acute myocardial infarction.**

**Objective:** To determine the prognostic value STE in lead aVR as an indicator of mortality risk with an AMI.

**Results:** Patients with STE in lead aVR greater than or equal to 1mm and in the presence of anterior infarction had a 15.6% mortality risk compared to those without aVR at 12.7% (P=0.0069). Those with an inferior MI had a 15.9% mortality rate compared to 6.5% without aVR involvement (P=0.0011). Concluded that STE in lead aVR provided important information on prognosis after an acute myocardial infarction.

**Critique:** Pros – large cohort size of individuals diagnosed with AMI. Cons – population utilized and location. Subjects were chosen based on criteria for HERO-2 trial. HERO-2 trial was performed in non-Western countries, which leads to no access to percutaneous coronary intervention (PCI).

**Study 2: Relationship of ST elevation in lead aVR with angiographic findings and outcome in non-ST elevation acute coronary syndromes.**

**Objective:** To evaluate the connection between STE in lead aVR with coronary angiography findings on cardiac catheterization, as well as with mortality rates.

**Results:** Patients with >1mm of ST elevation in aVR had higher in-hospital mortality rates compared to those with no or minor aVR STE (P<0.03). Mortality rate was also evaluated 6 months after hospital discharge. Mortality rate: 7.6% for patients that presented with no STE in aVR, 12.7% for those with minor elevation, and 18.3% for those with major STE (Fig. 2). Concluded that minor or major ST elevation in aVR correlates with an increased mortality rate when compared to those with no STE in aVR.

**Critique:** Pros – population included patients from 11 different countries with ACS diagnosed with NSTEMI. Cons – population size (76/5,064) with ACS and STE in lead aVR, the culprit lesion is not limited to the left main coronary artery, but rather may also indicate the LAD or involvement of all three main coronary arteries (triple vessel disease). The clinical use of lead aVR in isolation as a STEMI equivalent remains unclear. Therefore there is not strong enough evidence to support STE in lead aVR as a STEMI equivalent, but rather a potential marker of disease severity.

**Study 3: Utility of lead aVR for identifying the culprit lesion in acute myocardial infarction.**

**Objective:** To evaluate lead aVR as a tool to identify the vessel involved in an AMI.

**Results:** Table 1, summaries with concurrent STE in V2-V4, STE in lead aVR is beneficial in predicting proximal LAD involvement, with a high positive predictive value (PPV) and specificity. Five studies analyzing the ability of STE in lead aVR to predict left main stenosis (LMS) is shown in Table 2. There is inconsistent PPV but relatively reliable negative predictive values (NPV). The high NPV suggests that in the absence of STE in lead aVR, LMS is unlikely the culprit coronary artery.

**Critique:** Pros – overall organization and consolidation of information. Cons – Many cut-offs for significant lesions and mortality to be considered STE. Inconsistency of population demographics. Lead aVR not analyzed in isolation from the presence of anterior MI.

**METHODS**

Records identified through database searching (n = 489)

Records screened (n = 16)

Full text articles assessed for eligibility (n = 3)

Studies included in qualitative synthesis (n = 3)

Name of study

"Relationship of ST elevation in lead aVR with angiographic findings and outcome in non-ST elevation acute coronary syndromes."

"aVR STE elevation in important but neglected sign in ST elevation acute myocardial infarction"

"Utility of lead aVR for identifying the culprit lesion in acute myocardial infarction."

**RESULTS**

**Table 1:** Lead aVR STE for Diagnosis of proximal LAD lesion.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Pop</th>
<th>LMS Cases</th>
<th>Sens. (%)</th>
<th>Spec. (%)</th>
<th>PPV (%)</th>
<th>NPV (%)</th>
</tr>
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<tbody>
<tr>
<td>Barnsells et al</td>
<td>775</td>
<td>7</td>
<td>73</td>
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<td>5</td>
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<td>Hengsananon et al</td>
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<tr>
<td>Kosuge et al</td>
<td>310</td>
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<td>97</td>
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<td>Rosello et al</td>
<td>134</td>
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<tr>
<td>Yu et al</td>
<td>91</td>
<td>9</td>
<td>85</td>
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**Table 2:** Lead aVR STE for Diagnosis of LAD in NSTEMI.

<table>
<thead>
<tr>
<th>Studies</th>
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**REFERENCES**


2. https://doi.org/10.1016/j.ahj.2007.03.037


4. http://creativecommons.org/licenses/by-nc-sa/3.0/