A Retrospective Comparative Study of 12 Lead Electrocardiogram and 2D –
Echocardiography Derived Left Ventricular Ejection Fraction Among Patients of Fatima
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Introduction: The 12 lead electrocardiogram (12L ECG) is a standard diagnostic test for patients with
cardiac diseases especially those with depressed left ventricular ejection fraction. However, in areas
where access to 2D echocardiogram is limited, the 12L ECG may represent as one of the most cost-
effective diagnostic tool easily accessible in the community. Hence, the study was conducted to estimate
the left ventricular ejection fraction (LVEF) by 12L ECG and compare it with the LVEF taken from 2D
echocardiogram among patients of Fatima University Medical Center (FUMC).

Methods: A retrospective comparative study of patients with both 12L ECG and 2D echocardiogram
done at FUMC from January 2017 to December 2017 was conducted. The 12L ECG derived LVEF was
computed using the formula= (2.264 x aVR QRS amplitude) + (age x 0.645), and was compared
statistically with LVEF taken from 2D echocardiogram. Since age of the patient was used in the formula,
data were further stratified by age groups.

Result: A total of 655 subjects were included in the analysis. Sensitivity and specificity of 12L ECG to
detect a depressed ejection fraction was 94.12% and 63.58% respectively. A significant difference was
noted between 12L ECG derived LVEF and LVEF from 2D echocardiogram. However, results varied
among age groups.

Conclusion: A rapid and reliable estimation of LVEF is crucial in the management of the majority of
patients. With age adjustment formula, this simple yet effective method has the additional utility
secondary to the universal availability and ease of interpretation of the 12L ECG.