Case Report

Elderly Neglect from Hypertensive Crises and Left Bundle Branch Block to Ventricular Fibrillation and Death with Possible Infarction;

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Abstract

Rationale: *The elderly neglect including social restriction or isolation is a serious problem affecting the elders. Diagnosis of acute coronary syndrome, especially, ST-segment elevation myocardial infarction in the setting of a left bundle branch block is very complex. Hypertensive emergencies represented one of the most dangerous of all medical emergencies.* ***Patient concerns***: *An elderly housewife woman presented to the physician outpatient clinic with hypertensive crises, acute pulmonary edema, and electrocardiographic left bundle branch block.* ***Diagnosis***: *Hypertensive crises, acute pulmonary edema, and left bundle branch block.* ***Interventions***: *Electrocardiography, oxygenation, iv cannulation, and cardiopulmonary resuscitation.* ***Lessons***: *The elderly neglect including social restriction or isolation is a serious problem affecting the elders. Hypertensive crises, acute pulmonary edema in the presence of left bundle branch block is an alarm for death.* ***Outcomes***: *Unfortunately, ventricular fibrillation and sudden cardiac death was the end.*

Keywords: *Elderly neglect, Hypertensive crises, Left bundle branch block, Myocardial infarction, Ventricular fibrillation, Sudden cardiac death.*

Abbreviations

BP: Blood pressure

CPR: Cardiopulmonary resuscitation

ECG: Electrocardiogram

HE: Hypertensive emergency

HU: Hypertensive urgency

HTN: Hypertension

ICU; Intensive care unit

IVI; Intravenous infusion

LBBB; Left bundle branch block

MI: myocardial infarction

POC: Physician outpatient clinic

STEMI ST-segment elevation myocardial infarction

VF: Ventricular fibrillation

VR: Ventricular rate

Introduction

Elderly neglect is one of the most serious problems affecting elders. The care recipient related-risk factors are including social restriction or isolation, the defect of sharing in decision making, decreased cognitive function, and limited physical health **(**1**)**.

Diagnosis of an acute coronary syndrome, especially, **ST-segment elevation myocardial infarction (STEMI) in the setting of a left bundle branch block** (LBBB) is very complex **(**2**)**. Timely and accurate arrival to acute coronary obstruction in the presence of ischemic manifestations is a crucial step for both urgent angiography and convenient reperfusion intervention **(**2**)**. Electrocardiographic STEMI is the primary indication for emergency reperfusion therapy **(**1**)**. So, early STEMI identifying in cases of LBBB is still challenging **(**1**)**. LBBB is a considerable ECG puzzle for STEMI diagnosis **(**3**)**. Sgarbossa et al. suggested ECG

criteria for the diagnosis of STEMI in the presence of LBBB **(**2**)**. The criteria are essentially established on concordant ST-segment elevation, discordant ST-segment elevation, and anterior ST-segment depression in leads V1-V3, with points allocated for each criterion **(**3**)**. In many studies, the discordant ST-segment elevation criterion is less useful than the other two criteria to maintain a high specificity **(**3**)**. The best threshold for the Sgarbossa score is ≥3 **(**3**)**. A score of ≥3 generated from the Sgarbossa criteria has been frequently used by researchers **(**3**)**. Sgarbossa et al proposed requiring ≥3 points from the following criteria for the diagnosis of acute MI in the presence of LBBB:

1. Concordant ST-segment elevation of 1 mm (0.1 mV) in at least 1 lead (5 points).
2. Concordant ST-segment depression of at least 1 mm in leads V1 to V3 (3 points).
3. Or excessively discordant ST-segment elevation, defined as ≥5 mm of ST-segment elevation when the QRS result is negative (2 points) **(**4**)**.

Sgarbossa's rule, proposed for the diagnosis of acute MI in the presence of LBBB. In this rule, the third Sgarbossa component (excessively discordant ST-segment elevation as defined by 5 mm of ST-segment elevation in the setting of a negative QRS) is replaced by one defined proportionally by ST-segment elevation to S-wave depth (ST/S ratio), will have better diagnostic utility for STEMI equivalent **(**2**)**.

Hypertension is a devilishly common clinical dilemma, affecting one billion individuals worldwide and is responsible for an average of 7.1 million deaths annually **(**6**)**. Arterial hypertension (HTN) is the main independent risk factor for the development of cardiovascular disease (CVD) and mortality in both developed and developing countries **(**6**)**. About 1% of these patients will develop acute elevations in blood pressure (BP) at some point in their lifetime **(**8**)**. Hypertensive crises (76% urgencies and 24% emergencies) represented 3% of all the patient visits, but 27% of all medical emergencies **(**8**)**. Hypertensive crisis (HC) is defined as levels of systolic BP >180 mmHg and/or levels of diastolic BP >120 mmHg **(**6**)**. Depending on whether there is damage to vital organs or not, we can distinguish between hypertensive emergency (HE) and hypertensive urgency (HU) **(**6**)**. HE occurs in up to 2% of patients with systemic hypertension **(**8**)**. HE is life-threatening conditions because their outcome is complicated by acute damage to vital organs, and can be presented with neurological, renal, cardiovascular, microangiopathic, and obstetric complications **(**6**)**. HE includes hypertensive encephalopathy, hypertensive acute left ventricular relaxation associated with acute MI or unstable angina, aortic dissection, subarachnoid hemorrhage, ischemic stroke, and severe pre-eclampsia or eclampsia **(**6**)**. HU is the presence of severe HTN without progressive dysfunction of vital organs. The most frequent

presentations for HTN are headache, dyspnea, nausea, vomiting, epistaxis, and pronounced anxiety **(**6**)**. Immediate reduction in blood pressure is required only in patients with acute end-organ damage **(**7**)**. Nitroglycerin is a potent venodilator that reduces BP, decreasing preload, and cardiac output Therefore, it is not an acceptable first choice for HE excepts in patients with acute coronary syndrome **(**9**)**.

Ventricular fibrillation (VF) previously was known as a chaotic asynchronous fractionated activity of the heart. Recently VF is considered a turbulent, disorganized cardiac electrical like the recorded ECG deflections continuously change in shape, magnitude, and direction" **(**10**)**. VF results in cardiac arrest with loss of consciousness and no pulse **(**11**)**. VF can occur due to coronary heart disease, valvular heart disease, cardiomyopathy, Brugada syndrome, long QT syndrome, electric shock, or intracranial hemorrhage **(**11**)**. Diagnosis is by an electrocardiogram (ECG) showing irregular unformed QRS complexes without any clear P waves **(**11**)**. An important differential diagnosis is torsades de pointes **(**11**)**. Treatment is with cardiopulmonary resuscitation (CPR) and defibrillation **(**12**)**. Biphasic defibrillation may be better than monophasic **(**12**)**. The medication epinephrine or amiodarone may be given if initial treatments are not effective **(**11**)**. VF occurs in about 10% of people in cardiac arrest **(**11**)**. Rates of survival among those who are out of the hospital when the arrhythmia is detected are about 17% while in the hospital it is about 46% **(**11**), (**13**)**.

Case presentation

An 89-year-old married housewife Egyptian woman presented to the physician outpatient clinic (POC) with acute severe chest pain, palpitations, very distressed, and difficult breathing. The patient had a history of familial neglect. The chest pain had anginal characteristics. She complains about the above symptoms 12 hours ago. Unfortunately, her son neglects the mother to arrive at the doctor or hospital for medical care. Her vital signs were as follows: BP: 190/130 mmHg, the heart rate of 150/minute irregular, the body temperature of 36.6°C, respiratory rate of 44/min, and the initial pulse oximetry of 90%. The physician urgently calls the emergency ambulance. The patient initially managed with O2 inhalation using a nasal cannula at a rate of 5 *L/min, one* sublingual isosorbide *dinitrate tablet (5 mg), 2* frusemide iv amp (40 mg), and sublingual captopril tablet (25 mg) were given. The patient was urinarily catheterized with a nurse. RBS was 188 mg/dl on admission. The two ECG tracings urgently obtained in the physician outpatient clinic. The initial ECG tracing showed atrial fibrillations (VR;150 bpm), LBBB, and few premature ventricular contractions (**Figure 1**). Only one Sgarbossa criteria ECG finding that was discordant ST elevation > 5mm founded. Sgarbossa score was 2. The second

ECG tracing was taken within 3 minutes of the first ECG tracing after increasing the chest pain that showed ventricular fibrillation (**Figure 2**). Cardiac arrest had happened before the ambulance arrived. The physician tried cardiopulmonary resuscitation. But death was the end. Interestingly, chest pain got worse as the other Sgarbossa criteria were met, suggesting the presence of severe underlying disease. Non-STEMI and second type MI could be considered as differential diagnoses of the case, but the presence of a high Sgarbossa score ruled out this possibility.

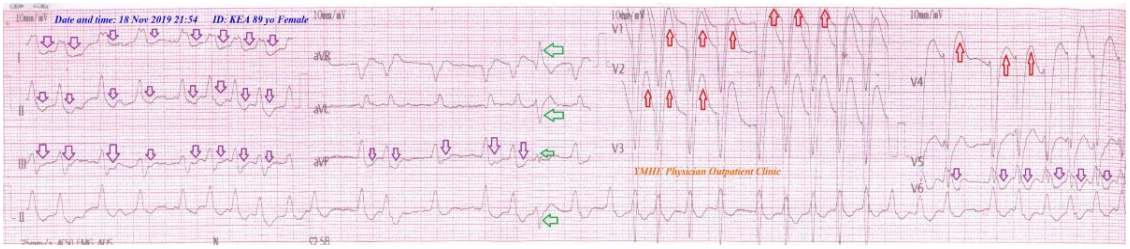

Figure 1: Initial ECG tracing was obtained in the physician outpatient clinic showed atrial fibrillations (VR;150 bpm), left bundle branch block, and few premature ventricular contractions in aVR, aVL, aVF, and II leads (green arrows). Red arrows indicate discordant ST elevation > 5 mm (V1-4) (one of Sgarbossa criteria scoring; 2). Purple arrows indicate discordant ST-segment depression abnormalities in I, II, III, aVF, and V6 leads.

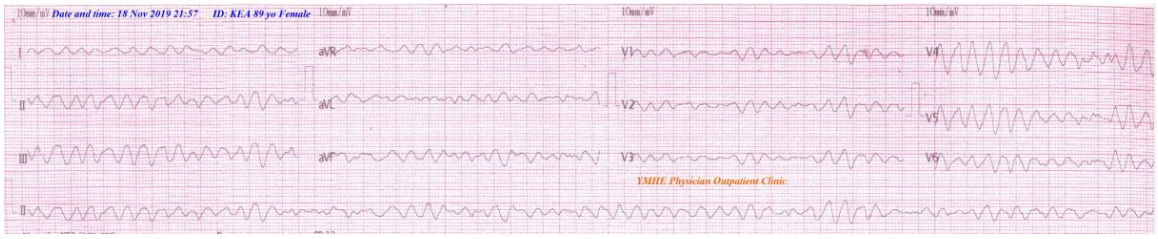

Figure 2: ECG tracing obtained in the POC was taken within 3 minutes of the above initial tracing showed ventricular fibrillation (VR;300 bpm).

Discussion

• **Overview**; An elderly housewife woman presented to the physician outpatient clinic with hypertensive crises and electrocardiographic left bundle branch block. There was a history of familial neglect. Deterioration in hypertension into hypertensive emergency and acute pulmonary edema had happened.

• **The primary objective** for my case study was the presence of hypertensive crises, acute pulmonary edema, and left bundle branch block is associated with familial neglect.

• **The secondary objective** for the case study was the emergency management of a hypertensive emergency, acute pulmonary edema, and left bundle branch block.

• Initial ECG tracing was showing a weak single of the Sgarbossa criterion of LBBB that is not meeting with the diagnosis of acute STEMI.

• The presence of LBBB, angina, and Sgarbossa score of (2) were weak indications for the presence of acute STEMI.

• The only initial electrocardiographic Sgarbossa criteria were discordant ST elevation > 5mm (score 2). This lonely ECG sign is an insufficient indication for a more serious condition.

• Discordant ST-segment depression abnormalities in I, II, III, aVF, and V6 leads have not coincided with traditional Sgarbossa criteria.

• Familial neglect in the author's opinion is considered the main cause of cardiovascular deterioration for the elder patient.

• The novelty in the case study was the marvelous progression of the hypertensive emergency and LBBB to acute pulmonary edema, ventricular fibrillation, and death.

• **Limitations of the study**; There are no known limitations in the study.

• I can't **compare with other cases**; there were similar cases for comparison in the previous medical literature.

Conclusion

• Both hypertensive emergencies in the presence of electrocardiographic LBBB pattern may be encompassing the serious consequences in the elderly patient.

• Familial neglect is considered the main cause of cardiovascular deterioration in old age patients.

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Conflicts of Interest

There are no conflicts of interest.

References

1. Lee J, Sun F, Chima E. “RISKS FOR ABUSE AND NEGLECT OF ELDERS WITH COGNITIVE IMPAIRMENT OR DEMENTIA”: INSIGHTS FROM THREE GROUPS. Innovation in Aging, 15 Nov 2018.

2. Stephen W. Smith, Kenneth W. Dodd, Timothy D. Henry, David M. Dvorak, Lesly A. Pearce. “Diagnosis of ST-Elevation Myocardial Infarction in the Presence of Left Bundle Branch Block With the ST-Elevation to S-Wave Ratio in a Modified Sgarbossa Rule”. Ann Emerg Med. 2012.

3. Richard E Gregg, Eric D Helfenbein, Sophia H Zhou. “Combining Sgarbossa and Selvester ECG Criteria to Improve STEMI Detection in the Presence of LBBB”. Computing in Cardiology 2010.

4. Sgarbossa EB, Pinski SL, Barbagelata A, et al. “Electrocardiographic diagnosis of evolving acute myocardial infarction in the presence of left bundle branch block”. N Engl J Med. 1996.

5. Meyers HP III, Limkakeng AT, Jr., Jaffa EJ, Patel A, Theiling BJ, Rezaie SR, et al. “Validation of the Modified Sgarbossa Criteria for Acute Coronary Occlusion in the Setting of Left Bundle Branch Block: Retrospective Case Control Study”. Annals of Emergency Medicine. 2015.

6. Sabina Salkic, Olivera Batic-Mujanovic, Farid Ljuca, Selmira Brkic. “Clinical Presentation of Hypertensive Crises in Emergency Medical Services”. Mater Sociomed. 2014.

7. Joseph Varon and Paul E Marik. “Clinical review: The management of hypertensive crises. Critical Care”. 2003.

8. Paul E. Marik and Racquel Rivera. “Hypertensive emergencies: an update. Curr Opin Crit Care”.

9. Norman M. Kaplan, Ronald G. Victor, Joseph T. Flynn. “Hypertensive Emergencies. Kaplan’s Clinical Hypertension”. Eleventh edit. Wolters Kluwer. 2015.

10. Robles de Medina EO, Bernard R, Coumel P. et al. “Definition of terms related to cardiac rhythm. WHO/ISFC Task Force”. Eur J Cardiol. 1978.

11. Baldzizhar A, Manuylova E, Marchenko R, Kryvalap Y, CareyMG. “Ventricular Tachycardias: Characteristics and Management". Critical Care Nursing Clinics of North America. 2016.

12. Neumar RW, Shuster M, Callaway CW, Gent LM, Atkins DL, Bhanji F, et al. “Part 1: Executive Summary: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care”. Circulation 2015.

14. Berdowski J, Berg RA, Tijssen JG, Koster RW. “Global incidences of out-of-hospital cardiac arrest and survival rates: Systematic review of 67 prospective studies”. Resuscitation 2010.

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