Hypertension and Sudden Cardiac Death: Their Relationship in Post Infarction Cardiac Rupture

Abstract

The purpose of this study was to assess the relationship between hypertension (H) and sudden cardiac death (SCD), defined as a result of a cardiac event heralded by an abrupt loss of consciousness within one hour from the onset of acute symptoms in healthy individuals and in patients (pts) suffering from heart disease, in pts died from post infarction cardiac rupture (PCR). 168 autopsy cases (100%) with acute myocardial infarction were studied. 108 pts were males (64%) and 60 (36%) females with a mean age 64.3+/_18 years. 46 pts (27%) showed PCR. Clinically, the presence of H and symptoms of impending rupture was recorded. Pathological exam was conducted by analyzing gross and microscopic characteristics of the myocardium and coronary arteries of all pts. 2 pts (4.3%) showed sudden H as a symptom of impending rupture (respectively from 118/86 mmHg to 180/95 mmHg and 145/90 mmHg to 190/98 mmHg) and chest pain resistant to opiates. They deceased within 1 hour from increased H. The other 44 pts with PCR were hypertensive in 27 cases (61%) at the admission, while 17 (39%) displayed no H. Pts with rupture had a statistically significant increase of coronary alterations, cardiac hypertrophy, and up to 90% coronary stenosis (P<0.01). H was a symptom of impending rupture followed by SCD not frequently observed.

Keywords: Sudden cardiac death; Hypertension; Post infarction cardiac rupture

Research Article

Volume 3 Issue 2 - 2015

Aurelio Leone*

Fellow of the American Society of Hypertension, USA
Fellow of the Royal Society for Promotion of Health, United Kingdom

***Corresponding author:** Aurelio Leone, Fellow of the Royal Society for Promotion of Health, Via Provinciale 27, 19030 Castelnuovo Magra (SP), Italy, Tel: +393472272215; Email: reliol@libero.it

Received: June 16, 2015 | **Published:** July 30, 2015

Introduction

The relationship between hypertension (H) and sudden cardiac death (SCD), defined as a result of a cardiac event heralded by an abrupt loss of consciousness within one hour from the onset of acute symptoms in healthy individuals and patients suffering from heart disease, is far to be well established [1-3]. On the contrary, pre-existing hypertension has been identified to be a factor, which is often associated with post infarction cardiac rupture (PCR) [4-6]. Evidence indicates that cardiac rupture during an acute myocardial infarction occurs with a high rate ranging up 8% in the patients affected by the acute ischemic disease [3-4,7-10]. The purpose of this retrospective study was to assess the relationship between H and SCD in pts died from post infarction cardiac rupture (PCR).

Material and Methods

168 autopsy cases with acute myocardial infarction were studied. 108 pts were males (64%) and 60 (36%) females with a mean age 64.3+/_18 years. 46 pts (27%) showed PCR. Clinically, the presence of H and symptoms of impending rupture was recorded. Pathological exam was conducted by analyzing gross and microscopic characteristics of the myocardium and coronary arteries of all patients using a method of investigation previously described [11]. The characteristics of study subjects are in Table 1.

Table 1: Study Population.

Number	168 (100%)
Males	108 (64%)
Females	60 (34%)
Mean age	64.3+/- 18 years
PCR	46 (27%)

Results

2 pts (4.3%) (Table 2) showed sudden H as a symptom of impending rupture (respectively from 118/86 mmHg to 180/95 mmHg and 145/90 mmHg to 190/98 mmHg) and chest pain resistant to opiates. They deceased within 1 hour from increased H. The other 44 pts with PCR were hypertensive in 27 cases (61%) at the admission, while 17 (39%) displayed no H. Pts with rupture (Figures 1-4), and Table 3 had a statistically significant number of multiple coronary alterations, cardiac hypertrophy (mean heart weight 627+/-188 grams and left ventricle wall thickness 25+/-3 mm vs 400+/-75 grams for heart weight and 14+/-2 mm for left ventricle wall thickness in pts with no rupture), irregular areas of confluent fibrosis and coronary narrowing up to 90% with a high incidence of occlusive thrombi.

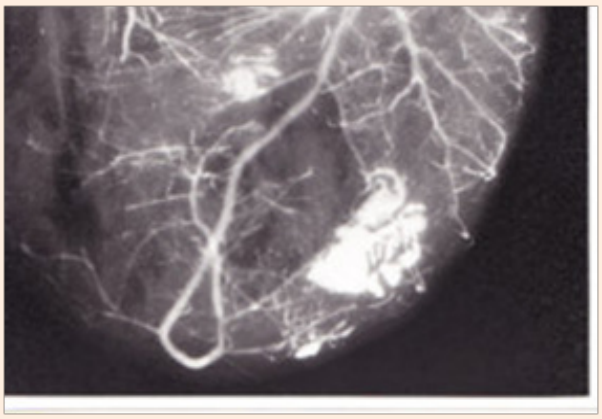

Figure 1: Postmortem angiography of heart with post infarction rupture. It can be seen an irregular filling of the coronary tree and a large avascular area at the site of the infarction.

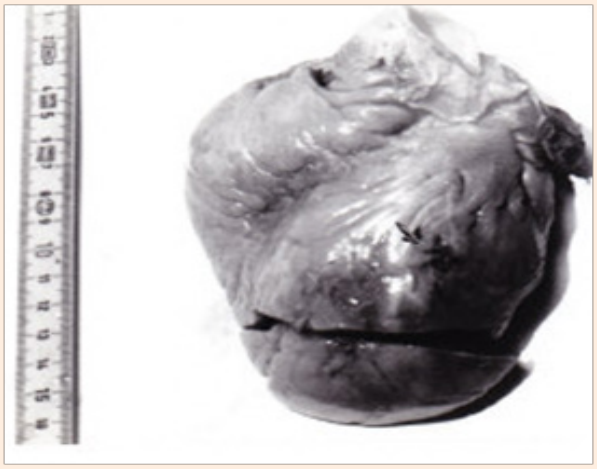

Figure 2: Irregular rupture line of the left ventricle anterior wall and marked cardiac hypertrophy of a patient acutely deceased from PCR.

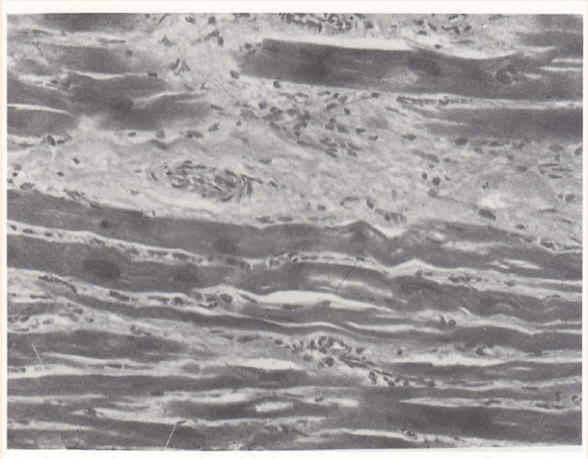

Figure 3: Microscopic changes in PCR. It can be seen confluent areas of fibrosis with a hemorrhagic occlusion of intramural coronary artery and myocardial fiber fragmentation.

Figure 4: Severe stenosis of the left coronary descending artery in PCR.

Table 2: BP increase in the 2 subjects before PCR.

Subjects (n°2; 4.3%)	BP Baseline	BP Before Rupture
1st	118/86mmHg	145/90 mmHg
2nd	180/95 mmHg	190/98 mmHg

Table 3: Parameters in PCR related to baseline H.

BP	Number	Heart Weigh (grams)	LV Wall Thickness (mm)
H	27 (61%)	627+/-188	25+/-3
NoH	17 (39%)	400+/-75	14+/-2

Conclusion

H was a symptom of impending rupture followed by SCD not frequently observed in contrast to the fact that pre-existing H appeared to be a variable often associated with the development of myocardial rupture.

References

1. Leone A (2014) Relation between coronary lesions and cigarette smoking of subjects deceased from acute myocardial infarction. A histopathological study. J Cardiobiol 2(2): 5.
2. Landini L, Leone A (2013) Effect of Hypertension in Heart Rupture of Acute Myocardial Infarction: Clinico-Pathological Study. Journal of Clinical Hypertension 15 Suppl 1: 181.
3. Leone A (1991) Are we able to prevent death due to postinfarction cardiac rupture by early diagnosis and surgical treatment?. Jpn Heart J 32(5): 635-644.
4. Leone A, Fabiano P, Bertanelli F, Mori L, Bertoncini G (1992) Postinfarction cardiac rupture in the nineties: do we know determinating factors? Singapore Med J 33(3): 282-286.
5. Leone A (1987) Postinfarction cardiac rupture: a challenge to try surgical reparation. G Ital Cardiol 17(3): 252-258.
6. Naeim F, De La Maza LM, Robbins SL (1972) Cardiac rupture during myocardial infarction. A review of 44 cases. Circulation 45: 1231-1239.

Citation: Leone A (2015) Hypertension and Sudden Cardiac Death: Their Relationship in Post Infarction Cardiac Rupture . J Cardiol Curr Res 3(2): 00094. DOI: 10.15406/jccr.2015.03.00094

7. Penther P, Gerbaux A, Blanc JJ, Morin JF, Julienne JL (1977) Myocardial infarction and rupture of the heart: a macroscopic pathologic study. Am Heart J 93(3): 302-305.

8. London RE, London SB (1965) Rupture of the heart. A critical analysis of 47 consecutive autopsy cases. Circulation 31(2): 202-208.

9. Schuster EH, Bulkley BH (1979) Expansion of transmural myocardial infarction: a pathophysiologic factor in cardiac rupture. Circulation 60(7): 1532-1538.

10. Wessler S, Zoll PM, Schlesinger MJ (1952) The pathogenesis of spontaneous cardiac rupture. Circulation 6: 334-351.

11. Leone A (1972) L'angiografia coronarica postmortem nello studio anatomopatologico del cuore. G Ital Cardiol 2: 488-492.

Citation: Leone A (2015) Hypertension and Sudden Cardiac Death: Their Relationship in Post Infarction Cardiac Rupture . J Cardiol Curr Res 3(2): 00094. DOI: 10.15406/jccr.2015.03.00094