

## THE INFLUENCE OF COLD IN CARDIOVASCULAR DISEASES

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### **Abstract**

*The statistics data indicate that coldness might have an influence upon the morbidity in cardiovascular diseases, the rate of these diseases seem to rise during winter. In this study, the authors have portrayed this reality by presenting a certain case. The subject is a woman of 29 years who passed away during winter, due to a cord malformation - ventricular septal defect. The uniqueness of this case is that the patient survived to adulthood without any surgery, considering that most people suffering from this malformation die in childhood.*

**Key words:** ventricular septal defect ( VSD ), cold, cardiovascular disease, autopsy.

### **INTRODUCTION**

Temperature variations and exposure to cold can significantly affect the health of persons suffering from cardiovascular diseases (National Research Council). The higher occurrence of cardiovascular diseases in winter is noted, and several explanatory mechanisms have been suggested based on increased blood pressure, haematological changes and respiratory infections. Statistics of correlations between cardiovascular morbidity and certain times of the year was expressed as a bimodal curve by Tromp in "Medical Biometeorology" (Tromp, SW). Analyzing and highlighting reactivity connections between the environment and morbidity in cardiovascular diseases, it appears that morbidity levels reach higher values during winter months and lower values in summer months (Irina Moroianu Zlătescu and all).

The congenital abnormalities of the heart and cardiovascular system are reported in almost 1% of live births (Ashley EA and all) and about half of these children need medical or surgical help (2009, American Heart Association). The common congenital heart defects are: ventricular septal defect (VSD), atrial septal defect (ASD), transposition of the great arteries (TGA) and patent ductus arteriosus (PDA). Ventricular septal defect (VSD)

is the most common congenital heart defect (ACHA). It can be small VSDs which are usually asymptomatic and compatible with a normal life (in fact, about 40% close spontaneously in early childhood) or large VSDs cause cardiac failure in the second or third month after birth. Large shunts should be closed surgically(CHD-UK.All).

## MATERIAL AND METHOD

I will present a case of sudden death occurred to a woman of 29 years, with unknown family history and personal history of major pathological importance such as non-cyanotic heart malformation - ventricular septal defect, 28 years ago ( Figure 1 ), ventricular premature beats for 5 years and congestive heart failure class NYHA II, severe pulmonary hypertension, tricuspid insufficiency grade III (Medical dossier).



Fig. 1 - Ventricular septal defect (VSD) shown by [Echocardiography](#)

The patient died in January during night around 02:00 a.m. at home in her sleep; carers alerted police and ambulance, CPR and administration of adrenaline were done but unfortunately without result.

The autopsy performed within 24 hours of death revealed the external examination corpse normostenic showing signs of medical treatment in the sternal region and on the back of her left hand, other various signs were represented by cyanosis of cephalic extremity, cyanosis of the nail bed and hippocratic fingers. At the internal examination, necropsy reveals an enlarged heart volume (Figure 2), with dimensions 15/18/6 cm with dilated right atrium size of 7/4/3 cm, a single ventricle dilated (large ventricular septal defect - lack of septum), left atrium size 2/3 cm, section of the myocardium scratchy brown, with whitish stripes, the thickness of ventricular wall in section was 1.5 cm (Report expertise).

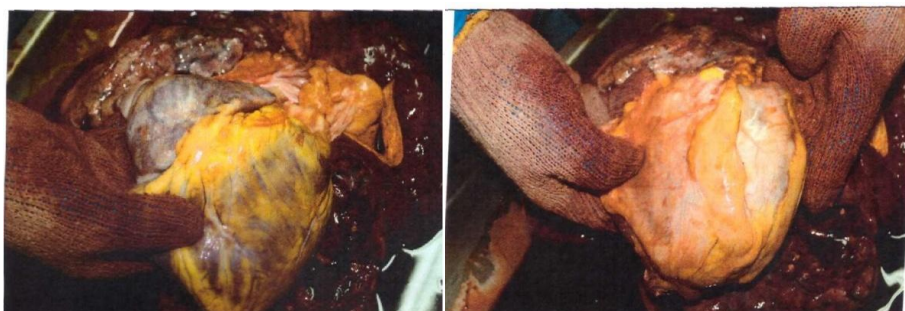


Fig. 1. Heart's aspect on surface

Aspect of the pericard

Hypertrophied papillary muscles with a yellowish tint, coronary with lowered flexibility, distended with ostium of 0.4 cm. Large vessels: the aorta with whitish pink intima, with atheromatous plaques, dilated pulmonary, with whitish pink intima and atheromatous plaques. The remaining were detected organs with stasis.

Concluding, her death was nonviolent; it is due to the cardio-circulatory insufficiency with a serious heart malformation (single congenital ventricle). (Report expertise)

## RESULTS AND DISCUSSIONS

There is a lot of evidence showing that cardiovascular deaths increase during the cold season of the year (Kloner RA). The reasons underlying the higher occurrence of cardiovascular conditions, particularly coronary heart disease, in winter have remained controversial. The detailed mechanisms by which cold influences the pathogenesis of cardiovascular manifestations, have not been clarified in full. Proposed mechanisms include ischaemia resulting from raised arterial blood pressure and the consequent increase in myocardial oxygen demand with a simultaneous decrease in coronary blood flow, and haematological changes following cold-induced vasoconstriction and consequent loss of plasma fluid, which predispose the subject to arterial thrombosis (Simo Näyhä).

Solving any case of sudden death is a challenge for the doctor, especially when the deceased is a young person, in such a situation it is required to relate all survey data, medical history, histopathological and toxicological examinations (Beliş V., Dermengiu D.).

Postmortem diagnosis on this case raised no major problems due to the obvious anatomical modifications accompanying this cardiac malformation namely the lack of interventricular septum. Also, the season

in which the death occurred is suggestive, knowing that cold can trigger death when cardiac affections are already existing.

## CONCLUSIONS

The uniqueness of this case is that the patient survived to adulthood without any surgery, considering that most people suffering from this malformation die in childhood.

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