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Dilated myocardiopatia in a newborn, a case report

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Abstract

Cardiomyopathy is defined by the presence of a dilated left ventricle (LV) with systolic dysfunction in the absence of a hemodynamic cause that can produce the existent dilation and dysfunction, including physiological (e.g., sepsis) or anatomic causes with either abnormal loading conditions (eg, coarctation of the aorta) or ischemia (eg, coronary artery anomalies). The estimate from the United States was 1.1 cases per 100 000 person-years, About 50% of cases in children and adolescents were characterized as dilated cardiomyopathy (DCM), with 10% to 25% of cases in this category attributable to acute myocarditis. Hypertrophic cardiomyopathies (HCMs) make up 35% to 50% of cases, and restrictive cardiomyopathies (RCMs) make up <5% of cases in children. The incidence of HCM was 3 times higher in children <1 year of age than in older children. Left ventricular (LV) myocardial noncompaction (LVNC) accounted for ≈ 5% of cases. This kind of pathology have an elevated mortality, and is no very usual in new born. The present report is the case of a male newborn that at 14 days old that get admission at emergency room by respiratory distress syndrome, with out other symptoms, with antecedent of have cough and nasal flux 24 hrs before, with out treatment, in the film of x ray with cardiomegaly and increase of the vascular tram, need mechanical ventilation, present holosistolic murmur, not infectious signs by clinic and laboratory, later present 4 heart attack that revert with advance cardiopulmonary reanimation, the echocardiogram report left ventricule very dilated and slimmed, important dilatation of venous low cava, hours later presents an increase in the holosistolic murmur have a heart arrest without respond to heart compression and finally dies. We are interested in this case because the presence of dilated cardiomyopathy in the newborn is not very common, so the emergency doctor should think about this pathology and be prepared for its attention, however mortality is very high and should be oriented management to try to help the patient.

Introduction:Dilated cardiomyopathy is defined by the presence of a dilated left ventricle (LV) with systolic dysfunction in the absence of a hemodynamic cause that can produce the existent dilation and dysfunction.The incidence of dilated cardiomyopathy are estimate in United States at 1.1 cases per 100 000 person-years in children under 20 years, with an incidence of 8.3 cases per 100 000 person-years in children under 1 year old. Are more common in male. About the half of the cases under 20 years old patients that have dilated cardiomyopathy (DCM), between the 10% to 25% of cases is associated to acute myocarditis. Also this kind of pathologys have an elevated mortality.About the pathogenetic causes of dilated cardiomyopathy categories it can be; primary (idiopathic, familial/genetic mutations), secondary (inflammatory, viral, immunity diseases, toxin associated, metabolic disorders, fatty acid oxidation disorders, glycogen storage diseases {type II y IV}, lyposomal store disorders, nutritional disorders, structural heart diseases, pulmonary diseases)

The idiopathic causes is the most common that can reach up to the 70%. The pathophysiology of dilated cardiomyopathy makes that approximately 1/3 of the myocardial cels presents apoptosis or necrosis with compensatory hypertrophy, with pathology remodelation of the heart, with growth of the miocardiac mase, ventricular dilation and slim of the ventricular walls. The principal clinical manifestation are; low cardiac outp ut, fluid retention and increased peripheral vasoconstriction. In the physical exploration we can find a patient with irritability, sweating, tachypnea, tachycardia, respiratory distress, and wheezing. If the causes of the dilated cardiomayopathy is inflammatory we can found feverish. To the palpation of the precordium we can found an apical impulse displaced downward and to the left also we can found jugular venous distention. To the auscultation is common to found a galloping noise, we can hear a murmur of mitral regurgitation. Is common to found hepatomegaly and ascites. The extremities will be cold and poorly perfused and this give us an increased capillary refill time. The oxygen saturation remains normal, except in severe cases of pulmonary edema.

Between the cabinet studies that help us to make diagnoses are found we can found:

Chest Radiography: we can saw a increased in the cardiac silhouette attributed to atrial and ventricular dilation. It can saw pleural effusion caused by the pulmonary edema.

Electrocardiogram is common to saw sinus tachycardia, a decrease in R wave voltage. The presence of deep Q waves in I and AVL could suggest an abnormal origin of the left coronary artery of the pulmonary artery trunk.

Echocardiography: It can appreciate that the left atrium and left ventricule are dilated, systolic function is decreased, segmental dyskinesia. It will show a slow blood circulation.

It will be a dilation of the suprahepatic and inferior vena cava, also a pleural and pericardial effusion. With color Doppler we will detect a mitral regurgitation and a tricuspid regurgitation. We can see a decrease in antegrade aortic flow.

Treatment:
Drugs: The treatment will be focus in rise cardiac output, there are many drugs that we can use for this like:

Digoxin; it have beneficial effect decreasing sympathetic tone that give us a reduces in the heart rate and improving the ventricular filling. But it is a drug that have many collateral effects so it will be manage with care.

Diuretics: it helps to reduce the volume that have to move the heart so produce a rapid improvement in the symptoms, the most used are furosemide and sprinolactone

Vasodilator agents; also helps reducing the afterload. There are many vasodilators but the most common used are nitroprusside, hydralazine, captopril and enalapril. The most used in children are captopril and enalapril.

Beta-blockers; the most common drug used in children are metoprololy cavedilol, improvement the left ventricular function and decrease the risk for arrhythmias. It improves with the combination of other drugs lick diuretics or ACE inhibitors.

Surgical:
Heart transplant: Transplantation is more likely in the first 2 years after diagnosis, it have a the survival at one year and at 5 years in children is 90% and 83%, respectively . It should be considered when short-term survival is unlikely or if there are severe symptoms that do not respond to conventional treatment.

Batista's operation**:** It consists of left partial ventriculectomy and mitral valve repair. In adults it has been shown to be effective but in children there is very little experience.

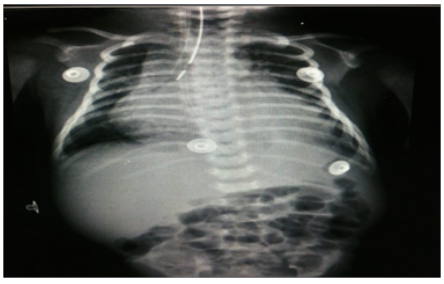
Case report**:** Male patient, who has the following antecedents: product of a 22-year-old mother, without pathologies, home occupation, lives in a rural area, home made of durable materials, does not have animals. Product of pregnancy 2, vaginal deliveries 2, with 3 check-ups during pregnancy, no infections are reported during pregnancy, the mother gains 13 kg during pregnancy. She was born in our hospital on 06.04.2019, by vaginal delivery, at 40 weeks of gestational age, with 3200 grams, weight 49 cm in height, Apgar 8/9, leaving the joint accommodation after 2 days without problems, with results waiting for neonatal metabolic screening, complete vaccines.

On 18/06/2019 at 2:53 p.m., the 14-day-old patient was taken by her mother to the emergency room because 24 hours before she started with a cough and runny nose, a few hours later she started with respiratory distress, without fever or hyporexia.

On physical examination she has vital signs; respiratory rate 66 breaths per minute, heart rate 166 beats per minute, temperature 36.4 ºC. Active, reactive, integument paleness, normotensive anterior fontanelle, symmetrical eyes, hydrated oral mucosa, hyperemic pharynx, patent nostrils, neck without lymph nodes, chest with respiratory distress, with thoracoabdominal dissociation, normal murmur vesicular sounds, heart with good intensity and sound, soft, depressed abdomen, peristalsis present, no megaly, male genitalia, 3 second skin filling.The first diagnosis was pneumonia and late neonatal sepsis, for which he was hospitalized, management with rapid solution, parenteral, oxygen with phase 1 ventilation, double antibiotic regimen, hemogram, chest X-ray is requested.

On 19/06/2019 00:20 hrs respiratory distress increases so phase III ventilation is started, On 19/06/2019 7:00 hrs: 15-day-old male, diagnosed with: congenital heart disease, metabolic acidosis, vital signs; respiratory rate 76 breaths per minute, ventilatory rate 169 breaths per minute, temperature 37ºC, blood pressure 55/23

In mechanical ventilation, under sedation, reactive to external stimuli, integument paleness, normotensive anterior fontanelle, symmetrical eyes, hydrated oral mucosa, neck without lymph nodes, chest without abnormal noises, heart with good intensity and sound, with holosistol grade 2 murmur in 2nd intercostal space, with radiation to the posterior thorax, soft and depressed abdomen, presence of peristalsis, liver 2 cm below the costal margin, male genitalia, 3-second skin filling. With elevated heart rate, normal blood pressure, without amines, with laboratories sodium 138, potassium 5, chlorum 101, calcium 9.3, magnesium 1.7, arterial blood gas pH 6.8, pco2 34, po2 74, hco2 - and eb - chest radiography x with cardiomegaly and growth of the vascular section. He found himself with fluid restriction, a load of crystalloid solution was transferred to 5 mgkg dose, with bicarbonate correction for 8 hrs, using furosemide. Infectious without inflammatory signs, blood biometry with leukocytes 13,300, neutrophils 5000, lymphocytes 5200, platelets 429000. Hematology without active bleeding with hb 15.7, ht 45.2, platelets 429000, neurology under sedation, normal anterior fontanelle.



The 19.06.19 16:10 hrs. 15-day-old male, diagnosed with: congenital heart disease, metabolic acidosis, 4 heart attacks, prerenal failure, hyperkalemia. ventilatory rate 39 breaths per minute, heart rate 185 beats per minute, temperature 37.8ºC, blood pressure 53/23. In mechanical ventilation with respiratory cycle 35, PIP 18 PEEP 5 FIO2 100%, under sedation, reactive, pale integuments, normotensive anterior fontanel, symmetrical eyes, hydrated oral mucosa, neck without lymph nodes, chest without abnormal sounds, heart with good intensity and sound, with a grade 4 of 6 holosistol murmur in the 2nd intercostal space, with radiation to the posterior thorax, soft and depressed abdomen, peristalsis present, liver 2 cm below the costal edge, male genitalia, skin filling for 3 seconds.

The patient presents a first cardiac arrest, he needs to apply 3 cycles of cardiac compression, adrenaline and sodium bicarbonate, with recovery of the heartbeat, 50 min later he presents a cardiac arrest, acquiring 2 cycles of cardiac compression, 1 dose of adrenaline and sodium bicarbonate, installing epinephrine infusion, with recovery of the heartbeat, 40 min after cardiac arrest requiring 2 cycles of cardiac compression and administration of epinephrine and dobutamine infusion, 30 min after cardiac arrest requiring 1 cycle of cardiac compression and administration of epinephrine, start furosemide and dopamine, with metabolic acidosis by bicarbonate correction, after infarction, serum electrolytes with glucose 138, potassium 8.3, magnesium 3, renal with anuria, creatinine 1.1, Pediatric cardiology is called who performs echocardiogram with report of situs solitus , levocardium, normal and pulmonary systemic venous return, significant dilation of venous under cava and peripheral, oval foramen of 2.4 mm with short circuit from left to right, interventricular septum integrum, severe tricuspid regurgitation, severe mitral regurgitation, very dilated and thin left ventricle, with hypokinesia and septal dyskinesia in its basal segment, large crossed vessels, unobstructed left aortic arch, mild aortic arch hypoplasia, confluent pulmonary artery, closed aortic duct. Cardiology suggests the use of levosimenda

On 06/19/2019 19:59 hrs. 15-day-old male, diagnosed with: congenital heart disease, metabolic acidosis, 4 heart attacks, prerenal insufficiency, hyperkalemia, cardiogenic shock, vital signs; respiratory rate 39 breaths per minute, heart rate 167 beats per minute, temperature 37.2ºC, blood pressure 53/23.

On mechanical ventilation with respiratory cycle 35, PIP 16 PEEP 4 FIO2 80%, under sedation, reactive, integument paleness, normotensive anterior fontanelle, symmetrical eyes, hydrated oral mucosa, neck without lymph nodes, chest without abnormal sounds, heart with good intensity and sound, with a grade 4 of 6 holosistol murmur in the 2nd intercostal space, with radiation to the posterior thorax, soft and depressed abdomen, peristalsis present, without visceromegaly, male genitalia, skin filling for 3 seconds. Patient with management of hemodynamic instability with dobutamine, furosemide and dopamine, with metabolic acidosis by bicarbonate correction, with anuria with increased dose of furosemide

On 06.20.19 00:15 hrs A 15-day-old male, diagnosed with: dilated cardiomyopathy, severe systolic dysfunction of the left venticle, severe tricuspid regurgitation, severe mitral regurgitation, patency of the forame ovale transverse arch with hypoplasia, prerenal insufficiency, hyplerkalemia. Vital signs; respiratory rate 45 breaths per minute, heart rate 100 beats per minute, temperature 37ºC, blood pressure 55/41. On mechanical ventilation with respiratory cycle 45, PIP 18 PEEP 5 FIO2 100%, under sedation, reactive, pale integuments, normotensive anterior fontanelle, symmetrical eyes, hydrated oral mucosa, neck without lymph nodes, chest without abnormal sounds, heart with good intensity and sound, with holosistol murmur grade 4 of 6 in the 2nd intercostal space, with radiation to the posterior thorax, soft and depressed abdomen, presence of peristalsis, liver 2 cm below the costal border, male genitalia, skin filling for 3 seconds, pulses non-palpable peripherals

Arterial blood gas with pH 7.29 PCO2 50 PO2 104 HC03 22 EB -2.6, with aminergic support (dobutamine, dopamine) parenteral solution 100 ml kg / day, sodium 127 potassium 7.8 calcium 7.2, glucose 106. with correction of electrolyte disturbances by parenteral solutions. On 06.20.2019 00:15 hrs has a cardiac arrest without response to cardiac compression with the hour of illness 00:15 hrs.

Conclusion: Large numbers of newborns come to the emergency department of our hospital requesting medical attention for various reasons. Between 10 and 15% of these patients arrive in critical condition, in a state of shock of various etiology, the most frequent being septic or hypovolemic shock, the etiology being a poor feeding technique or sepsis. However, sometimes we find that there are patients who do not fit into these conditions, being necessary to look for some other cause, especially in those patients who were previously healthy and without associated pathologies. One of these causes is dilated cardiomyopathy, which is a rare pathology in the newborn and therefore difficult to identify due to the few days of the patient's life, to which the drugs that can develop this type of disease are not normally exposed. lesions at the cardiac level, and that at the cardiac level, unless they have a previous congenital heart disease, they generally have a healthy heart.

Dilated cardiomyopathy is a pathology of uncertain evolution, in which one third of patients recover, one third of patients will have chronic heart disease and one third of patients will die, so the identification of this pathology allows the doctor to be able to carry out the necessary actions to try to give the best management to the patient, either temporarily or permanently, although most of the actions are carried out in adult patients,

the experience in newborns being limited. In the analysis of the clinical case, a pharyngeal picture, probably viral, can be observed, which made the initial suspicion of a pneumonic process due to deterioration of ventilatory function, requiring the use of mechanical ventilation, with the chest X-ray ruling out the pneumonic process and observing cardiomegaly, that make the suspect of a congenital heart disease is suspected, initiating fluid restriction, an echocardiogram is requested to evaluate the cardiac condition, because this resource was not available in the hospital, it was requested on an outpatient basis while the echocardiogram is expected, while It is expected to be carried out, it presents 4 cardiac arrests, when performing the echocardiogram a dilated cardiomyopathy is observed, however at this time the patient no longer responds adequately to amines until he does not respond to advanced resuscitation maneuvers.

In this case, the evolution of the dilated cardiomyopathy was very rapid, probably triggered by a viral process and that despite the attempts to stabilize the patient was not enough to prevent death, so it is important to take it into account within the Shock diagnostics. in previously healthy patients, dilated cardiomyopathy, since we can focus the necessary actions to try to bring the patient to fruition.

Biography:

Dr.Francisco Javier Sanchez Reyes, master in health administration system, specialist in pediatrics since 2005, chief in charge of pediatrics division in General Hospital of Tlalnepantla since 2016 to 2018, sub chief in charge in pediatric division in Maternal – Pediatric Hospital of Atizapan since 2018 to the actuality, in private consulter since 2005.

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