Hyperhomocysteinemia as a Cause of Left Main Artery Thrombosis Manifesting as Extensive Anterior Wall MI in a 10 Year Old Girl

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Abstract
Paediatric MI / Aute coronary syndrome is uncommonly thought over due to its rarity and atypical presentation. It is difficult to diagnose due to normal T wave inversion phenomena (Persistent juvenile pattern) seen in them (up to the age of 12 years). Although the causes are altogether different from adults; the management is more or less the same; but the safety and role of Atorvastatin in them is not clear.

Case Report
A 10 year old female with no premorbid illness presented in casualty with complaints of acute chest pain of 30 minutes duration. On examination she was crying and was in respiratory distress. She had a pulse of 120 bpm with a BP of 60 / 40 mm Hg. was afebrile and had a respiratory rate of 30 /min. Auscultation revealed bilateral coarse crepitations allover the lung fields, S3 gallop was present without any murmur.12 lead ECG showed extensive anterior wall MI (Figure 1). Immediately aspirin and clopidogrel was given to her and she was started on dopamine infusion to maintain her BP. Injection frusemide 40 mg IV stat was given and call sent to cath. Lab for PAMI in view of cardiogenic shock. Coronary angiogram revealed totally occluded left main coronary artery from the ostium (Figure 2), right coronary circulation was normal. Immediately without wasting time guide catheter was engaged just outside the ostium of left main coronary artery and guide wires were crossed across the left main and into left anterior descending coronary artery and Ramus intermedius and successful angioplasty of the left main was done with 3.0 x 12 mm endeavour resolute stent (Figures 3, 4 and 5) achieving a good result and patient was shifted to ICU. Blood investigations were essentially normal including complete blood count and platelets, lipid profile, creatinine, liver function tests, PT, PTT, TSH, protein C,S, antithrombin, APLA, ANA, p-ANCA, c-ANCA. Her troponin T was quantified as 0.6 ng/ml against a normal of 0.1 ng/ml and her CPK- MB was 106 units (0-6 units); strangely she had a homocysteine level which was markedly high above the normal with an absolute value of 140 units (normal maximal upto11 units).

Discussion
Acute myocardial infarction in infancy and childhood is rare unlike in adults where acute coronary syndrome constitute the leading cause of death worldwide when combined with cerebrovascular events as per WHO data. Paediatric MI differs from adult MI in various ways and hence slightly difficult to recognise unless thought of as a rare but uncommon entity. Breathlessness is the main symptom of MI unlike adults where chest pain is the most common symptom and even if the child reports of chest pain the character described is rather sharp and not crushing type. Unlike adults where...
atherosclerosis is the pathophysiology causing acute coronary syndrome, congenital heart diseases e.g:

ALCAPA (anomalous origin of left coronary artery from main pulmonary artery), Kawasaki's disease, Takayasu's arteritis, myocarditis are the commoner causes.

Other common cause are severe cyanosis, inutero paradoxical emboli, perinatal asphyxia, thrombosed or embolised coronary artery, infections, generalised arterial calcification of infancy.

Also paediatric MI has a high mortality when compared to adult MI. Children who have suffered MI in the post event phase have relatively good exercise capacity for the same left ventricular function and also the incidence of sudden cardiac death is lesser when compared for adult subgroups.

Toubin et al. have laid specific criteria for diagnosis
of STEMI (ST Elevation Myocardial Infarction):
1. Wide Q waves (> 35 ms) with or without Q wave notching
2. ST segment elevation (> 2 mm)
3. Prolonged QT interval corrected for heart rate (> 440 ms) with accompanying Q wave abnormalities.

Differential diagnosis of chest pain in children includes:

- Infections: Acute viral myocarditis, bacterial, fungal endocarditis.
- Neoplasms and paraneoplastic syndromes
- Inflammatory vasculitis: SLE and PAN
- Inborn errors of metabolism / genetic disorders.
- Trauma / Iatrogenic / Substance abuse e.g cocaine
- Miscellaneous (post heart transplant coronary vasculopathy).

Treatment

Antiplatelets [Ecosprin (3-5 mg/kg body wt) and clopidogrel (1 mg/kg body wt)], statins (atorvastatin or rosuvastatin), beta blockers (1-2 mg/kg body wt), [angiotensin converting enzyme inhibitors; ACEI, (Enalapril 0.1-0.6 mg /kg body wt)], heparin (2 mg/ kg body wt), thrombolytics (1000 – 4000 units / kg over 30 minutes / Percutaneous coronary interventions (PCI) are the drugs / options available for children presenting with acute MI. Unlike the adults where the evidence for PCI in acute coronary syndrome is enormous; in paediatric MI evidence is limited. Punamiya et. al have reported two cases of left main PCI in patients of Takayasu arteritis with coronary involvement which I there in about 10% of all patients with Takayasu arteritis. In our case the patient was immediately taken up for PCI in view of cardiogenic shock and her life was salvaged.

References