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The complex interplay in the regulation of cardiac pathophysiologic functionalities by protein kinases and phosphatases

Protein phosphorylation regulates several dimensions of cell fate and is substantially dysregulated in pathophysiological instances as evident spatiotemporally via intracellular localizations or compartmentalizations with discrete control by specific kinases and phosphatases. Cardiovascular disease manifests as an intricately complex entity presenting as a derangement of the cardiovascular system. Cardiac or heart failure connotes the pathophysiological state in which deficient cardiac output compromises the body burden and requirements. Protein kinases regulate several pathophysiological processes and are emerging targets for drug lead or discovery. The protein kinases are family members of the serine/threonine phosphatases. Protein kinases covalently modify proteins by attaching phosphate groups from ATP to residues of serine, threonine and/or tyrosine. Protein kinases and phosphatases are pivotal in the regulatory mechanisms in the reversible phosphorylation of diverse effectors whereby discrete signaling molecules regulate cardiac excitation and contraction. Protein phosphorylation is critical for the sustenance of cardiac functionalities. The two major contributory ingredients to progressive myocardium derangement are dysregulation of Ca2+ processes and contemporaneous elevated concentrations of reactive oxygen species, ROS. Certain cardiac abnormalities include cardiac myopathy or hypertrophy due to response in untoward haemodynamic demand with concomitant progressive heart failure. The homeostasis or equilibrium between protein kinases and phosphatases influence cardiac morphology and excitability during pathological and physiological processes of the cardiovascular system. Inasmuch as protein kinases regulate numerous dimensions of normal cellular functions, the pathophysiological dysfunctionality of protein kinase signaling pathways undergirds the molecular aspects of several cardiovascular diseases or disorders as related in this study. These have presented protein kinases as essential and potential targets for drug discovery and heart disease therapy.

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Open heart surgery in Nigerian children the need for international and regional collaboration: The Bayelsa and Enugu experience

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Background: Children with congenital heart diseases (CHD) often require palliative or definitive surgical heart interventions to restore cardiopulmonary function. Lack of early cardiac intervention contributes to large numbers of potentially preventable deaths and sufferings among children with such conditions.

Objectives: The aim of this study was to highlight our experience and the importance of international and regional collaboration for open heart surgery in children with CHD and capacity building of local cardiac teams in Bayelsa and Enugu States.

Methodology: In November 2016, a memorandum of understanding (MOU) was signed by the managements of FMC, Yenagoa, Bayelsa State, UNTH, Enugu and an Italian-based NGO- Pobic Open Heart International for collaboration in the area of free open heart surgery for children with CHDs and training of local cardiac teams from both institutions either in Nigeria or in Italy. Patients for the program were recruited from Bayelsa and Enugu States with referrals from all over the country with combined screening and selection done in UNTH. Selected patients were operated on and funded free of charge by the Italian NGO. Hands on training of the local cardiac teams and cardiac intervention was done twice yearly in Nigeria.

Result: From inception of the program in November, 2016 to May, 2019 a total of 47 children (21 Males, 26 Females; age range 6 months to 14 years) with various types of congenital heart defects had free open heart surgery from the program with 41 surgeries done in UNTH & 6 in Italy (complex pathologies). Also, home cardiac teams from UNTH and FMC, Yenagoa gained from on-site capacity training & retraining from the Italian cardiac team both in Nigeria and in Italy. The Success rate was 95.7% (44) and Case Fatality rate was 4.3% (2).

Conclusion: There is a great efficacy in early cardiac intervention. This is with respect to a high success rate and minimal Case Fatality seen in this study. This was achieved through Regional and international collaboration.

Case Report **Published Date:-2021-05-05 00:00:00**

Unusual and severe peripartum cardiomyopathy: A case report

Peripartum cardiomyopathy (PPCM) is a relatively rare cardiac disease that manifests in the final stage of pregnancy and in the first months after delivery in women with no preexisting heart disease. Many etiological processes have been suggested: viral myocarditis, abnormal immune response to pregnancy, excessive prolactin excretion, prolonged tocolysis and a familiar predisposition to PPCM. Its diagnosis is often delayed because its symptoms, which include fatigue, dyspnea and palpitations are nonspecific. For this reason the diagnosis of PPCM is still made by exclusion of other etiologies. The long-term prognosis, once the acute phase is over, is a function of myocardial damage, this varies from complete functional recovery to chronic HF. The outcome of PPCM is highly variable with an alevated risk of fetomaternal morbidity and mortality. We report a serious case of a 40 years old female with biamniotic bicorionic twin pregnancy (PMA) who delivered by caesarean section and developed acute PPCM on post-operative. Symptoms occurred two hours after an intramuscular injection of two vials of methylergonovine the same day of cesarean delivery. These manifested in sudden tachypnoe, tachycardia and the appearance itchy maculopapular rash on her chest. On further evaluation, ECHO revealed cardiomegaly with reduced ejection fraction (< 15%). The case was successfully managed by a multidisciplinary team, using drugs like levosimendan and cabergoline, which rapresent emerging strategy in this clinical context.
