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THE BIOPHYSICAL PROPERTIES OF THE AORTA ARE ALTERED FOLLOWING KAWASAKI DISEASE WITH SEVERE CORONARY ARTERY LESIONS

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BACKGROUND: The long term sequelae of Kawasaki disease (KD) are typically based on the coronary complications. Attempts to detect peripheral endothelial dysfunction remain controversial. Other reports suggesting an increase of the intima media thickness in the carotid arteries also tried to mimic atherosclerotic pathophysiology concepts. Instead of extrapolating from the atherosclerosis hypothesis, we based our hypothesis on the fact that KD causes a generalized vasculitis, with documented aneurisms in the femoral, iliac, renal, axillary and brachial arteries. The aim of this work was to study the aortic biophysical properties (ABP) following KD attempting to study the integrative systemic arterial vasculature.

CONCLUSION: Our study identified significant alteration of multiple ABP parameters in a cohort of KD patients with coronary artery sequelae. The findings reflect increased strain, stiffness and vascular impedance. This implies that despite an apparent resolution of the systemic vaculitis, the acute impact of the disease persists years after contracting KD. Unlike the intima media thickness of the carotid arteries and the brachial flow mediated response studies this non-invasive assessment of the systemic vasculature biophysical properties represents the integrated and complex function of the systemic arterial tree. Future directions towards arterial multilevel and multilayer scarring, renal vascular interaction, and vascular autonomous dysregulation need to be studies thoroughly.

Reseau Mère Enfant de la Francophonie

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ECHO-DOPPLER ASSESSMENT OF THE BIOPHYSICAL PROPERTIES OF THE AORTA IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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BACKGROUND: To study the biophysical properties of the thoracic aorta in children with chronic kidney disease (CKD) using a non-invasive Echo-Doppler technique.

CONCLUSION: The increased Zi and Zc in pediatric CKD patients indicate intravascular changes resulting in a higher pulsatile ejection load for the left ventricle. The increased arterial stiffness indexes may be secondary to increased blood pressure. However, the normal PWV suggests that central arterial changes have not occurred yet. Further studies may elucidate the factors responsible for these vascular changes and methods of prevention of permanent vascular disease reported in the late stages of CKD.

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CLINICAL AND FUNCTIONAL EVOLUTION OF ISCHEMIC SEQUELAE IN PATIENTS WITH ABNORMAL LEFT CORONARY ARTERY ORIGINATING FROM THE PULMONARY ARTERY (ALCAPA)

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ALCAPA is a rare congenital malformation usually with dramatic manifestations if unrecognised and untreated surgically. In the early post-operative period, ischemic sequelae including left ventricular dysfunction, mitral regurgitation and fibroelastosis persist despite a good repair. The purpose of this study was to evaluate the long-term clinical and functional evolution of ischemic sequelae in patients with ALCAPA.

Surviving patients with surgically corrected ALCAPA normalised SF at 1 year, normalised ST segment at 10 years but mitral regurgitation persisted in all patients at the last follow-up. The treadmill of all patients was normal and the long-term functional status was excellent.

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THE FATE AND CURRENT MANAGEMENT OF GIANT CORONARY ARTERY ANEURYSMS SECONDARY TO KAWASAKI DISEASE IN THE PROVINCE OF QUEBEC

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The prevalence of coronary artery (CA) involvement in untreated cases of Kawasaki disease (KD) is approximately 15-25%, which decreases to less than 5% when IVIG is administered within 10 days of onset of fever. The rate of CA aneurysm regression has been shown to be mostly related to their initial size, giant aneurysms = 8mm (GA) rarely regress and exhibit the highest risk of subsequent stenosis. We therefore sought to determine the outcomes related to GA in the province of Québec, as there is little population-based long-term data available for the Canadian population.

KD-related GA occurred in nearly 2% of patients of this retrospective analysis. It seems to affect Québec residents proportionally to its ethnic make-up, without specific predilection to Asians. The current management of GA is based on institutional preferences due to the absence of evidence-based recommendations. These initial Québec-based observations warrant a larger national collaborative study.

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ASSOCIATION BETWEEN SLEEP AND CARDIOVASCULAR RISK FACTORS IN ADOLESCENTS

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Emerging data in adult patients have shown that there is an association between lower quantity and quality of sleep and increased cardiovascular risk. A similar association in adolescents has not yet been reported.

In adolescents, sleep duration and disturbances are associated with increased cardiovascular risk and adipostiy in cross-sectional assessment. The underlying mechanisms and causality of the associations necessitate further study.

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INCREMENTAL UTILITY OF USING WAIST CIRCUMFERENCE IN ADDITION TO BODY MASS INDEX WHEN EVALUATING THE ASSOCIATION BETWEEN ADIPOSITY AND CARDIOVASCULAR RISK IN ADOLESCENTS

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Previous studies have shown a clear link between increased adiposity and cardiovascular risk in children and adolescents. Although body mass index (BMI) is used in most studies, controversy remains as to what population-based measures of adiposity best correlate with cardiovascular risk. We sought to investigate whether adding the measurement of waist circumference to BMI improves specification of the association between adiposity and cardiovascular risk.

The addition of waist circumference to BMI assessment in adolescents improves stratification of cardiovascular risk and should be a component of evaluations and counseling.

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DETERMINANTS OF PULMONARY REGURGITATION AFTER TETRALOGY OF FALLOT REPAIR

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BACKGROUND: Chronic pulmonary regurgitation (PR) after Tetralogy of Fallot (TOF) repair is associated with cardiomegaly and adverse outcomes. In clinical practice the left pulmonary artery (LPA) contributes more than the right (RPA) to total pulmonary regurgitation. Multiple mechanisms are speculated to influence the degree of differential PR but evidence-based data is lacking. We aimed to identify factors that determine the differences in magnitude of flow reversal from the LPA and RPA, using magnetic resonance imaging (MRI).

CONCLUSION: Sternotomy for Tetralogy of Fallot repair and chronic RV dilatation lead to an altered configuration of the ribs and sternum as well as to a changed mediastinal geometry with increased cardiac angle. These changes result in decreased left lung volume, and presumably, increased vascular resistance. This does not affect systolic flow, but leads to increased diastolic flow reversal in the LPA and consequently increases the regurgitant fraction and volume. Increased PR leads to worsening right ventricular dilatation, contributing to further deterioration and imbalance of pulmonary perfusion.

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NEW AUDITORY TRAINING PROGRAM RAPIDLY TEACHES STUDENTS TO DISTINGUISH INNOCENT AND PATHOLOGICAL MURMURS WITH 90% ACCURACY

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BACKGROUND: Recognition of normal and abnormal heart sounds and murmurs is of key importance in detecting heart disease in children and adults as well as avoiding unnecessary investigations and anxiety. Many reports have shown that heart auscultation is poorly performed by physicians and physicians in training. Current teaching methods are often archaic, lack clear objectives and not informed by modern neuropsychological understanding of sound recognition. Repetition is crucial to auditory recognition but many teaching programs emphasize a variety of murmurs and sounds rather than repetition of a few common examples, normal and abnormal. New approaches for teaching auscultation are needed.

CONCLUSION: This new auditory training program rapidly teaches students to distinguish innocent and pathological murmurs with 90% accuracy. Medical education is not necessary for success with the program. Reinforcement teaching will likely be important. Results to be updated to meeting date.

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ECHO DOPPLER ASSESSMENT OF VASCULAR FUNCTION IN POST-OPERATIVE CONGENITAL HEART DISEASE

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BACKGROUND: Most children with congenital heart disease (CHD) now survive until adulthood with a good quality of life. In some forms of CHD the aorta may be large and abnormal which has implications for future cardiovascular risk. Therefore, we sought to assess the biophysical properties of the aorta of children with 3 types of CHD: tetralogy of Fallot (TOF); coarctation of the aorta (COA); and transposition of great arteries (TGA).

CONCLUSION: Children with certain forms of CHD have impaired biophysical properties of the aorta, with increased PWV, impedance and stiffness. This predisposes them to early-onset cardiovascular events such as elevated blood pressure and ischemic events. Further studies are needed to determine if improvements in surgical techniques and post-surgical therapy can modify the biophysical properties of the aorta.

Fondazione Ettore e Valeria Rossi

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NEWBORN FEMALE HEMODYNAMIC DISADVANTAGE IN RESPONSE TO HYPEROXIA

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Approximately, 5% of newborn infants need ventilator stimulation after birth, 20% of which require more extensive ventilator support. Typically, inspired air is composed of 21% O2, however using O2 levels of 100% during newborn resuscitation is routine practice. Exposing newborns to 100% O2, introduces a condition known as hyperoxia. A recent clinical study demonstrated gender-specific differences in the beneficial effects produced by avoiding hyperoxia. It is known that hyperoxia in newborn males results in hemodynamic impairment. However, these changes have yet to be established in females. Therefore, we investigated gender-specific hemodynamic differences in a newborn's response to hyperoxia.

This study demonstrates that sex-related differences exist even in the newborn's hemodynamic responses to hyperoxia. Specifically, newborn females, when compared to males, showed an exaggerated hemodynamic response with earlier and greater reductions in SBP, DBP, MAP, and greater increases in heart rate. These observations suggest there is a sex-related difference in hemodynamic response to hyperoxia, which must be taken into account in newborn resuscitation strategies.

Heart and Stroke Foundation

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SERUM ALBUMIN LEVEL Z-SCORE IS ASSOCIATED WITH CORONARY ARTERY ABNORMALITIES IN PATIENTS WITH ACUTE KAWASAKI DISEASE

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Absolute serum albumin level is one of the few universally recognized risk factors for coronary artery abnormalities after Kawasaki disease (KD). There is a high correlation between serum albumin level and age at diagnosis, but there is a paucity of information on normal values in healthy children.

Current risk stratification for patients with KD is based on absolute blood albumin level; based on this study it is possible that risk stratification be improved by using albumin z-score rather than absolute values. This would be contingent on obtaining age-appropriate normal values for blood albumin level in this population.

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OUTCOMES OF OBSTRUCTIVE PEDIATRIC PRIMARY CARDIAC TUMOURS: A 20-YEAR SINGLE CENTRE REVIEW

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BACKGROUND: Primary cardiac tumours in the pediatric age group are rare and often benign; however, intervention is sometimes necessary for those causing hemodynamically significant obstruction. Observation is recommended for obstructive cardiac tumours without clinical instability and with the potential for regression. As the sensitivity of both fetal and postnatal echocardiography has improved, tumours have been identified more frequently and with various degrees of subclinical obstruction. The safety and long-term outcomes from the contemporary conservative management for asymptomatic obstructive tumours has not been well evaluated.

CONCLUSION: Our data suggest that children with intracardiac tumours with echocardiographic features of obstruction but without clinical symptoms can be safely observed. However, close follow-up is indicated as 2 out of 9 patients managed conservatively in our study had issues related to their aortic valve after regression of the left ventricular outflow tract tumours. We did not observe a rising trend in the detection of cardiac tumours or subclinical obstruction during our study period.