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02 - Heart and Ships

Effect of cholesterol and fructose supplementation on the biochemical parameters, hormonal, oxidative stress and histopathology of the abdominal aorta of young male and female Wistar rats in growth

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Background In Algeria, the modernization of our society induced a sudden change in our eating habits. Indeed, children and adolescent are the main target of junk food. Among the youngest, the excessive consumption of foods with high energy values constitute a conjunction of risk factors exposing them to the risk of developing metabolic and cardiovascular pathologies.

Purpose Our objective is to study the impact of cholesterol and fructose supplemented diet on the metabolic, hormonal, and oxidative status and on the histopathology of the abdominal aorta of young male and female Wistar rats during growth.

Methods Wistar rats, 5 to 6 weeks old, are divided into male (MT, $n=6$) and female control group (FT, $n=6$), in male (MC, $n=6$) and female (FC, $n=6$) experimental group 1 supplemented daily with 3% cholesterol and 1.5% sodium cholates by force-feeding, and in a second experimental group male (MCF, $n=6$) and female (FCF, $n=6$) supplemented daily with 3% cholesterol and 1.5% sodium cholates by force-feeding plus free access to a 15% fructose solution.

Results Twelve weeks later, we assessed biochemical parameters (glycemia, total cholesterol, triglycerides, LDLc, HDLc and uric acid), insulin and oxidative stress parameters (MDA, GPx and NO). Moreover, we analyzed the histo-morphometry of the abdominal aorta for all animals. These results are compared with those obtained in matched control rats. In groups 1 and 2, hypercaloric diets caused statistically significant disruption of the plasma biochemical parameters (Table 1), as previously reported [1,2,3] and has a significant increase on oxidative stress parameters [4,5]. Otherwise, the morphological examination revealed vascular remodeling illustrated by thickening of the arterial walls and important tissue and cell alterations of the studied abdominal aorta [3,6,7].

Conclusion Hyper-caloric diets composed resulted in metabolic, hormonal and oxidative disorders which may be at the origin of the multiple abdominal aortic wall thickening and tissue lesions observed in both male and female growing Wistar rats.

Table 1 Effects of cholesterol and fructose supplementation, for 12 weeks, on the blood biochemical, hormonal and oxidative parameters in growing male and female Wistar rats.

	Male			Female		
Rats groups Parameters	MT	MC	MCF	FT	FC	FCF
Glycemia (mg/dl)	75.50 ± 3.15	211.33 ± 2.33[d]	106.50 ± 5.96[c,d]	78.00 ± 2.50	125.33 ± 6.12[d]	117.33 ± 9.37[c]
Insuline (µU/l)	0.13 ± 0.01	0.30 ± 0.02[c]	0.45 ± 0.08[a,c]	0.13 ± 0.01	0.27 ± 0.05	0.27 ± 0.05[b]
Total Cholestérol (mg/dl)	70.33 ± 4.86	230.0 ± 14.01[b]	201.73 ± 40.3[b]	69.17 ± 3.4	192.33 ± 14.01[d]	179.25 ± 36.27[b]
Triglycerides (mg/dl)	44.64 ± 2.53	57.87 ± 1.66[c]	57.88 ± 2.49[c]	44.54 ± 2.8	57.58 ± 1.57[d]	54.91 ± 3.15[c]
LDLc (mg/dl)	15.68 ± 6.47	64.62 ± 8.91[c]	160.58 ± 19.69[a,c]	13.22 ± 7.02	47.99 ± 4.44[c]	154.02 ± 11.97[d]
HDLc (mg/dl)	56.65 ± 5.47	29.71 ± 5.07[a]	36.98 ± 3.35[a]	57.67 ± 9.72	20.94 ± 1.12[c]	27.33 ± 5.34[b]
Uric Acid (mg/l)	13.57 ± 1.94	21.43 ± 1.65[a]	20.85 ± 1.69[a]	14.29 ± 2.42	20.71 ± 1.83[a]	21.96 ± 1.74[a]
MDA (µmol/ml)	106.81 ± 20.6	215.81 ± 8.69[c]	191.82 ± 20.41[a]	112.2 ± 13.65	204.47 ± 14.64[c]	226.22 ± 51.99[a]
GPx (µmol/ml)	0.07 ± 0.009	0.14 ± 0.017[b]	0.11 ± 0.005[d]	0.05 ± 0.010	0.1 ± 0.027	0.09 ± 0.025
NO (µmol/ml)	23.6 ± 0.73	39.97 ± 3.06[c]	36.00 ± 1.07[d]	22.73 ± 2.92	38.70 ± 4.75[a]	38.90 ± 3.44[c]

The average values are assigned the standard error to the mean (SEM). MC vs. MT, MCF vs. MT, FC vs. FT, FCF vs. FT. MC vs. MCF, FC vs. FCF.

a $P \leq 0.05$ insignificant.
b $P \leq 0.02$ significant.
c $P \leq 0.01$ very significant.
d $P \leq 0.001$ highly significant.

Disclosure of interest The authors declare that they have no competing interest.

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Correlation of serum uric acid levels with traditional risk factors and cardiovascular disease in the area of Blida (Algeria)

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Purpose To investigate the relationship of Serum Uric Acid (SUA) levels with the traditional risk factors and fatal cardiovascular disease (CVD) in the area of Blida (Algeria).
Methods We prospectively enrolled 1954 hypertensive patients: 912 men (57.4 ± 8.5 years old) and 1042 women (56.3 ± 8.7 years old) consulting for evaluation in our hypertension clinic. In all subjects; routine blood chemistry, including SUA determination, echocardiographic examination, office and 24 h ambulatory blood pressure (BP) monitoring were obtained along with data regarding lifestyle habits. The risk of fatal cardiovascular disease was evaluated by using the SCORE risk chart for countries with low CVD risk based on the following risk factors: age, sex, smoking, systolic BP and total cholesterol.
Results Spearman analysis showed that the SUA levels were significantly and positively associated with the average 24 hours systolic BP levels (RS = 0.088, $P < 0.02$ for SBP) but not with diastolic BP levels (RS = 0.051, $P > 0.05$). Furthermore, the Kruskal Wallis analysis revealed that SUA levels were significantly associated with fatal CVD risk ($P < 0.01$). Specifically, patients with SCORE risk < 1%, between 1—5%, risk > 5% had SUA levels of 5.3 ± 1.1 mg/dl, 5.9 ± 1.3 mg/dl and 6.7 ± 1.7 mg/dl respectively (Z:- 6.9 $P < 0.001$). SUA levels were significantly associated with almost all major risk factors. Specifically SUA levels were significantly higher in males (Mann-Whitney U = 17384.70, $P < 0.01$), in elder patients (RS = 0.12, $P < 0.01$), in patients with increased body mass index (RS = 0.381, $P < 0.01$), with diabetes (U = 17745.70, $P < 0.05$) and with increased systolic BP levels (RS = 0.087, $P < 0.04$). In contrast, smoking status was not related with SUA levels (P = NS). Regarding lipoproteins, only serum HDL levels were significantly associated with SUA levels (RS= — 0.327, $P < 0.01$) but not total cholesterol and LDL plasma levels (NS).
Conclusions Subjects with lower SUA levels presented lower BP levels as well as SCORE risk for fatal cardiovascular disease. SUA levels were significantly associated with SBP levels. The relative importance of these associations has made it possible to specify the possible role of uric acid in the cardiovascular continuum.
Disclosure of interest The authors declare that they have no competing interest.

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High blood pressure and Systemic Lupus Erythematosus

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Introduction Systemic lupus erythematosus (SLE) is an autoimmune systemic disease affecting young women and associated with high cardiovascular risk. Hypertension during SLE is more frequent than in the general population and occurs earlier. Its pathophysiology remains unclear.
The purpose of our study is to report the clinical data of hypertensive patients with SLE.
Patients and methods Our retrospective study included 24 patients with lupus and hypertension among 67 lupus patients hospitalized in the internal medicine department between 2011 and 2017.
Results Our patients were 22 women and 2 men (mean age 46 years old). SLE had been evolving for an average of 12 years. Lupus nephropathy was present in 15 cases and 8 patients had renal failure. The treatment was based on steroids for all patients, 20 of them received synthetic antimalarial drugs, 18 patients had immune suppressors and 2 patients received a biotherapy.
The average age of onset of hypertension was 37 years; 5 years after SLE diagnosis. Hypertension was essential in 8 cases, attributable to SLE in 14 cases, corticoid-induced in 17 cases and secondary to renal failure in 7 cases. A multiple origin was retained in half of the cases. Each patient had an average of 5 cardiovascular risk factors in addition to hypertension and SLE. Treatment relied primarily on angiotensin converting enzyme inhibitors, calcium channel blockers and beta-blockers. Monotherapy was used in 8 cases. A blood pressure control was obtained in 17 patients. Seven developed complications such as hypertensive heart disease ($n = 6$) and retinopathy ($n = 3$). Ten patients had atherosclerosis, 6 of whom had a cardiovascular complication. The average age of the latter group was 46 years.
Conclusion Hypertension during SLE is frequent and multifactorial. It is associated with accelerated atherosclerosis and a high risk of cardiovascular disease. A better understanding of the pathophysiology of hypertension during SLE would improve the prognosis.
Disclosure of interest The authors declare that they have no competing interest.

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Simplified pulse wave velocity measurement in children: A validation study of the pOpmètre®

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Background In populations exposed to cardiovascular risk, aortic stiffness is an important marker assessed by the gold standard carotid-to-femoral pulse wave velocity (PWV). In childhood, the aplanation tonometer SphygmoCor® is a validated method, however, it is limited in routine practice by the child's cooperation