P79: ULTRASONOGRAPHIC CHARACTERIZATION OF THE DB/DB MOUSE, AN ANIMAL MODEL OF METABOLIC ABNORMALITIES

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Conclusions: *ob/ob* mice presented a premature cardiac dysfunction without a further age-related deterioration and a reduction in the abdominal aorta and carotid artery mean diameter in adult age.

P79
ULTRASONOGRAPHIC CHARACTERIZATION OF THE db/db MOUSE, AN ANIMAL MODEL OF METABOLIC ABNORMALITIES

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Purpose/Background/Objectives: The availability of an animal model that, beside common blood parameters like hyperglycemia or high lipid levels, reliably mirrors organ damage occurring in metabolic diseases, is an urgent need. These animals have not been fully characterized in terms of cardiovascular, renal and hepatic ultrasound parameters, and only sparse and discordant values can be found in literature. Aim of this paper is to provide a detailed, non invasive description of heart, vessels, liver and kidneys of the *db/db* mouse by ultrasound imaging.
Methods: 16 wild type and 34 *db/db* 11 week-old male mice were studied. State of the art ultrasound technology was used to acquire images of cardiovascular, renal and hepatic districts. A full set of parameters describing function of the selected organs was evaluated.
Results: *db/db* mice are characterized by systolic and diastolic dysfunction, confirmed by strain analysis. On the contrary, abdominal aortic and carotid stiffness seem to be not increased in these diabetic rodents; furthermore, they are characterized by a smaller mean diameter for both vessels. Renal microcirculation is significantly compromised, while liver steatosis is only borderline higher in *db/db* mice than in control animals.
Conclusions: We offer here for the first time an *in vivo* detailed ultrasonographic characterization of the *db/db* mouse model, providing a useful tool for a thoughtful choice of the right rodent model for any experimental design.

P80
IDENTIFICATION OF RADIAL VASCULAR WALL ABNORMALITIES BY VERY-HIGH FREQUENCY ULTRASOUND IN PATIENTS WITH FIBROMUSCULAR DYSPLASIA: THE FUCHSIA STUDY

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Aim: This case-control study is aimed at identifying radial vascular wall abnormalities in patients with fibromuscular dysplasia (FMD).
Methods: High-frequency ultrasound scans of radial arteries were obtained by VevoMD (70 MHz probe, FUJIFILM, VisualSonics). Radial wall showed two echogenic interfaces: the 1st (lumen-media) and the 2nd (media-adventitia). Intima-media (IMT), adventitia (AT), and global thickness (IMAT) and wall cross-sectional area (WCSA) Measured. Vascular wall disarray was assessed calculating the root mean square error (RMSE) between 20 gray-level profiles crossing the two interfaces and the profile obtained averaging them, normalized for the maximum value of the corresponding mean profile (RMSE/mean).
Results: 11 treated hypertensive female FMD patients and 8 healthy controls (C) were enrolled (age 52 ± 5 vs 45 ± 13 years, p = 0.51; BMI 26 ± 3 vs 23 ± 3 kg/mg, p = 0.12; mean BP 97 ± 7 vs 85 ± 10 mmHg, p = 0.01). Radial lumen was similar; IMT (0.166 ± 0.037 vs 0.128 ± 0.022 mm, p = 0.03), AT (0.114 ± 0.029 vs 0.083 ± 0.019 mm, p = 0.008) and IMAT (0.281 ± 0.042 vs 0.211 ± 0.027 mm, p = 0.003) were higher in FMD. Wall/lumen ratio was similar and WCSA increased in FMD.
The maximum values of 1st (121 ± 43 vs 157 ± 22, p = 0.09) and 2nd interface 109 ± 44 vs 133 ± 18, p = 0.09) tended to be lower, whereas RMSE/mean was higher in FMD (1st 1.31 ± 0.24 vs 0.83 ± 0.32, p = 0.006; 2nd 1.37 ± 0.38 vs 0.94 ± 0.32, p = 0.03). The difference was attenuated for the 1st but not for the 2nd interface when considering age and mean BP as covariates (p = 0.054 and p = 0.016 respectively).

Radial artery

Healthy control

Fibromuscolar dysplasia
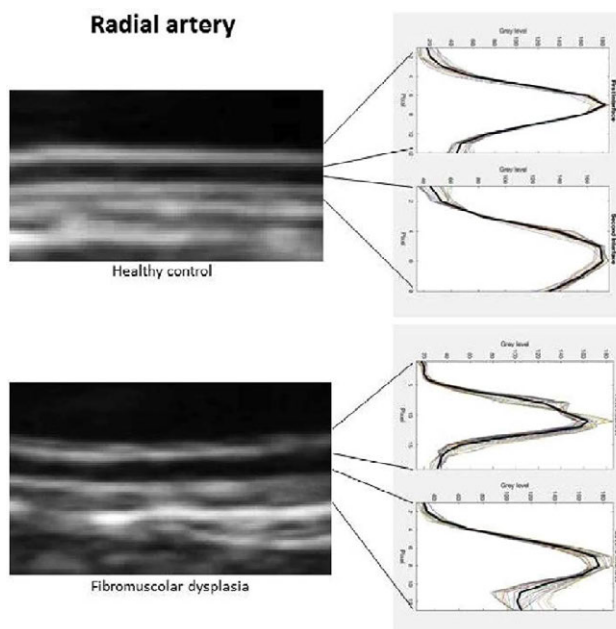
Conclusions: The radial artery wall of hypertensive FMD patients shows increased thickness and its ultrastructure is characterized of loss of echogenicity and inhomogeneity of the two echogenic layers.

P81
DISARRAY AND REMODELING OF THE RADIAL ARTERY IN WOMEN WITH SPONTANEOUS CORONARY ARTERY DISSECTION: THE FUCHSIA STUDY

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Background: Spontaneous coronary dissection (SCAD) may represent a manifestation of fibromuscular dysplasia (FMD); thus, preclinical lesions might be found in extracoronary vessels with similar size and wall ultrastructure, such as the radial artery.
Methods: Two 5'-clips from the left radial artery were obtained by Vevo MD (70 MHz probe, FUJIFILM, VisualSonics). Radial wall showed two echogenic interfaces: the 1st (lumen-media) and the 2nd (media-adventitia). Intima-media (IMT), adventitia (AT), and global thickness (IMAT) and wall cross-sectional area (WCSA) Measured.
Vascular wall disarray was assessed calculating the root mean square error (RMSE) between 20 gray-level profiles crossing the two interfaces and the profile obtained averaging them, normalized for the maximum value of the corresponding mean profile (RMSE/mean).