SP069 **GUT MICROBIOTA AND FAECAL LEVELS OF SHORT CHAIN FATTY ACIDS DIFFER UPON BLOOD PRESSURE LEVELS IN MAN**

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INTRODUCTION AND AIMS: High blood pressure (HBP) is a worldwide public health issue. The pathophysiology of primary HBP - the most common form of HBP - remains largely unknown. Recent observations in rodents and patients suggest that gut microbiota (GM) may influence BP homeostasis, namely via carbohydrate fermentation end-products.

METHODS: After informed consent, male patients and volunteers were prospectively recruited and categorized into 3 groups according to 2013 European Society of Hypertension criteria based on 24-hour BP measurements (Spacelabs 90207) : (i) hypertension (24-h BP $\geq$130 and/or $\geq$80 mmHg or in the presence of an antihypertensive treatment); (ii) borderline (24-h BP $<$130-80 mmHg but with either an isolated daytime hypertension ($\geq$135 and/or $\geq$85 mmHg) or a nocturnal hypertension ($\geq$120 and/or $\geq$70 mmHg)); (iii) normotension (24-h BP $<$130-80 mmHg and untreated). Stool, urine and serum samples were systematically collected in fasting conditions. GM characterization was performed by V1-V3 16S amplicon sequencing and metagenetics. Metabolomics was conducted on the 3 types of samples using nuclear magnetic resonance, and short chain fatty acids (SCFA) were quantified. Two-way ANOVA combined with Tukey post-hoc test were statistically used.

RESULTS: The cohort included 55 males (mean age: 55.5 $\pm$ 10.5 years): 39 with hypertension (21 treated with antihypertensive medications), 7 with borderline BP, and 9

with normotension (Table 1). No significant difference was observed between groups concerning age, BMI, rate of smokers and weekly alcohol consumption. Eight participants had diabetes and all were in the hypertensive group. History of cardiovascular or gastroenterological disease did not differ as well as the frequencies of antibiotic treatment during the previous 3 months before data collection. GM from hypertensive and borderline patients showed significantly increased abundance of *Prevotella* genus and reduced presence of *Bacteroides* genus in comparison to controls. SCFA levels were significantly different among groups, with stool levels of acetate, butyrate and propionate reaching 63.2 ± 5.6, 19.8 ± 2.8 and 16.7 ± 2.4 for untreated hypertensive patients versus 16.0 ± 4.7, 4.4 ± 1.4 and 3.6 ± 1.3 for normotensive individuals, respectively. No significant difference was observed in serum and urine metabolomes. By contrast, regression lines for stool metabolomes of patients highlighted correlations with mean (MBP), systolic (SBP) and diastolic (DBP) BP levels. Stool samples from untreated hypertensive, borderline and controls patients correlated with MBP levels, with R^2 coefficients reaching 0.86, 0.94 and 0.94, respectively. Similar R^2 values were obtained regarding SBP and DBP linear regressions.

CONCLUSIONS: Our pilot study supports an association between GM composition and BP levels, with significant impacts on stool abundance of fermentation-derived SCFA.

Table 1: Clinical characteristics of the 3 24-h ambulatory blood pressure profiles

	Reference to 24-h Blood Pressure			
	Normotension	Borderline	Hypertension	P
N	9	7	39	
Age (years)	46.2 ± 11.4	50.3 ± 13.3	52.9 ± 8.9	0.50
BMI (kg/m²)	24.3 ± 1.1	23.9 ± 3.5	27.3 ± 3.6	0.66
Smokers (%)	11	14	11	0.80
Alcohol (glass/week)	5.7 ± 4	3.8 ± 3	5.3 ± 5.4	0.98
Family HT (%)	55	45	43	0.80
Diabetes (%)	0	0	8	
CV history (%)	11	14	26	0.53
GE history (%)	33	43	46	0.79
Current antibiotics (%)	0	0	2.6	
Antibiotics during previous 3 months (%)	22	43	13	0.16
24-h Systolic BP (mmHg)	118 ± 6	124 ± 5	137 ± 14	<0.0001
24-h Diastolic BP (mmHg)	73 ± 5	77 ± 1	85 ± 11	0.0018
Anti-HT treatment (%)	0	0	54	
N anti-HT class (median)			3 (1-6)	
Diuretics (%)			28	
Beta blockers (%)			26	
CCBs (%)			41	
ACEIs (%)			28	
ARBs (%)			23	
Central agents (%)			13	

ACEIs: angiotensin-converting enzyme inhibitors; ARBs: angiotensin II receptor blockers; BMI: body mass index; BP: blood pressure; CCBs: calcium channel blockers; CV: cardiovascular; GE: gastroenterological; HT: hypertension