THLBB2020_PUB001: FINRISK 2002 microbiome dataset

Cohort: FINRISK 2002, 6953 participants
Data set accession number in THL Biobank: THLBB2020_PUB001

Publication information

Original publication
Association Between the Gut Microbiota and Blood Pressure in a Population Cohort of 6953 Individuals.
Joonatan Palmu, Aaro Salosensaari, Aki S Havulinna, Susan Cheng, Michael Inouye, Mohit Jain, Rodolfo A Salido, Karenina Sanders, Caitriona Brennan, Gregory C Humphrey, Jon G Sanders, Erkki Vartiainen, Tiina Laatikainen, Pekka Jousilahti, Veikko Salomaa, Rob Knight, Leo Lahti, Teemu J Niiranen.

Published article's journal and reference information

Journal of the American Heart Association 2020 Aug 4; 9(15):e016641, Epub 2020 Jul 21.
DOI: https://doi.org/10.1161/JAHA.120.016641

Data set availability information

Availability of Data and Materials
The data that support the findings of this study are available from Finnish Institute for Health and Welfare Biobank (https://thl.fi/en/web/thl-biobank). The data are not publicly available because they contain information that could compromise research participant privacy/consent. The source code for the analyses is openly available at 10.5281/zenodo.3622730.

Sampling, sample handling and variable description

Methods are described in detail in the publication. Below is information directly copied from the publication (doi: 10.1161/JAHA.120.016641):

Stool Sampling and Storage
Stool samples were collected at home after the physical examination in 50-mL Falcon tubes and were mailed to Finnish Institute for Health and Welfare using prepaid packages over 1 to 2 days. The samples were then frozen in −20°C and kept unthawed until 2017, when they underwent metagenomic sequencing.

Stool DNA Extraction and Library Preparation
Microbiota analysis was performed at the University of California, San Diego, using whole genome untargeted shallow shotgun metagenomic sequencing against mapped reference databases, following a previously published protocol. In brief, Illumina-compatible libraries were prepared from isolated DNA and normalized to 5-ng input per sample. Samples were pooled using the iTru dual-indexing system and sequenced using Illumina Hi-Seq 4000 for paired-end 150-bp reads. Sequence reads were mapped against taxonomy using SHOGUN v1.0.5 against National Center for Biotechnology Information RefSeq database (version 82; May 8, 2017). Functional profiles were calculated from a combination of observed and predicted Kyoto Encyclopedia of Genes and Genomes Orthology group (KO) annotations from the RefSeq genomes following the predicted parameters of the SHOGUN tool.

Outcome Variables and Covariates
The mean of the 2 measurements was used to determine systolic and diastolic BP. Hypertension was defined as systolic BP ≥140 mm Hg, diastolic BP ≥90 mm Hg, or use of antihypertensive medication. Pulse pressure was defined as systolic minus diastolic BP. Mean arterial pressure was defined as follows: [(2×diastolic BP)+systolic BP]/3.

Body mass index was defined as weight (kilograms) divided by the square of the body height (meters). Participants were asked to assess their leisure-time physical activity by a 4-option multiple choice question. The 4 options for leisure-time activity were (1) sedentary, (2) light activity for >4 hours per week, (3) fitness training or other strenuous exercise for >3 hours per week, and (4) competitive sports. Information on medication use was retrieved from the Finnish national Drug Purchase Register, which captures all prescription drug purchases in Finland. Finnish pharmacies fill prescriptions for a maximum of 3 months, and antihypertensive medication use was defined as a drug purchase occurring within the 4 months preceding baseline. Medications with the following Anatomical Therapeutic Chemical classification codes were considered antihypertensive medications: diuretics (C03*), β blockers (C07*), calcium channel blockers (C08*), and renin–angiotensin system inhibitors (C09*). Prevalent diabetes mellitus was defined as self-reported diabetes mellitus, a previous diagnostic code indicating diabetes mellitus in the nationwide Care Register for Health Care (*International Classification of Diseases, Tenth Revision* [*ICD-10*], codes E10-E14 or *International Classification of Diseases, Eighth Revision*/*International Classification of Diseases, Ninth Revision* [*ICD-8*/*ICD-9*], code 250), a previous diabetes mellitus medication purchase (Anatomical Therapeutic Chemical classification code A10*), or special reimbursement code for diabetes mellitus medications in the Drug Reimbursement Register. Smoking was defined by self-reported current daily smoking.

Description of microbiome dataset available for study through THL Biobank

Microbiome sequence data as described above.

Variables from FINRISK collection:
"MEN" gender ==1
"BL_AGE", age at baseline (baseline_visit_date – birth_date)/365.24
"SYSTM" Systolic blood pressure, average of 2 measurements (sys1+ sys2)/2
"DIASM" Diastolic blood pressure, average of 2 measurements, (dias1+dias2)/2
"BMI" Body mass index (weight/height^2) calculated from measured weight and height at baseline visit
"CURR_SMOKE" self-reported current daily smoking
"Q57X" from questionnaire: Exercise at free time
"NA." laboratory result, Sodium from urine sample
"U_VIRTSA_YHT" laboratory result, total urine amount
"BP_TREAT" if Q29 eq 1 then BP_TREAT=0 ; * bp medication never used ;
else if Q30 in (1,2) then BP_TREAT=1 ; * taken bp medication within 0-7 days ;
else BP_TREAT = 0 ; /*
[Q29: Have you ever used medicine for high blood pressure? Value 1: No; Q30: When was the last time you took medicine for high blood pressure? Value 1: Today or yesterday, value 2: 2-7 days ago]

Register-based data of FINRISK participants:
"PREVAL_DIAB", Prevalent diabetes (type II or I)
"PREVAL_CHD", Prevalent major coronary heart disease event
"PREVAL_CR_ANYCANC", any information from cancer registry before or at baseline visit
"BL_USE_RX_C09", drug purchase 0-4 months before FINRISKIn baseline visit, ATC-code C09*
"BL_USE_RX_C03", drug purchase 0-4 months before FINRISKIn baseline visit, ATC-code C03*
"BL_USE_RX_C07", drug purchase 0-4 months before FINRISKIn baseline visit, ATC-code C07*
"BL_USE_RX_C08", drug purchase 0-4 months before FINRISKIn baseline visit, ATC-code C08*

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