Personalized medicine in paediatric asthma

A collaboration between the Netherlands Twin Register (VU) and the Dept. of Respiratory medicine (AMC)

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Netherlands Twin Register

- Ongoing longitudinal study
- Every 2-3 years questionnaires, since 1987
- DNA of a subsample of twins available
- Linked to the Achmea Health care database for asthma and ADHD
Precision Medicine, Dept. of respiratory medicine (AMC)

PiCA: to bring academic experts in the field of personalized medicine for childhood asthma together and stimulate innovation
Collaboration

This collaboration leads to:

- Working together 1 day a week
- Proof of principle replication of 17q21
- Implementation of NTR data in the PiCA consortium
- Further understandig of asthma (pharmaco)genetics
Timeline

August: We received the APH grant
August 15th: Meeting with the PI’s NTR and AMC

September: PhD student started to work 1 day a week at the NTR and also followed a course in R

November: Encoding pharmacy data finished
Start data analysis
Step 1: Subject selection

Step 2: Harmonisation and cleaning
1. Cleaning name and address fields
2. Correct drug names and coupling of ATC-codes

Step 3: Data exploration
1. Names and interpretation of variables
2. Number of records, missing values, duplicates, consistency

Step 4: Data validation
1. Same date of birth
2. Spelling differences in surname
3. Same drugs in NTR questionnaires as in Achmea Health Database

Step 5: Creation of linkage keys
Determine the optimal combination of linkage keys

Step 6: Pilot linkage
Running pilot linkages to detect irregularities and determine the optimal settings for linkage algorithms

Step 7: Final linkage
NTR/Achmea asthma database facts

- Number of twins included in both datasets: 3,729
- Amount of prescriptions: 29,398

<table>
<thead>
<tr>
<th>Year</th>
<th>Total insured individuals</th>
<th>Total individuals with asthma medication</th>
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<tbody>
<tr>
<td>2006</td>
<td>3,392</td>
<td>320</td>
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</table>
Future research questions

1. Difference in asthma related hospital and policlinic visits between MZ and DZ twins

2. Difference in asthma medication steps (and thus asthma severity) in MZ and DZ twins

3. Relation between specific genes and the diagnosis of asthma

4. Difference in asthma medication use within Arg16Arg, Arg16Gly and Gly16Gly patients

5. Replication of 17q21 for asthma exacerbations and childhood onset asthma
Other questions?