

A novel psychiatric registry

A system and its utilization for clinical and pharmaceutical research

CHALLENGES: Secure, clean and analyzable psychiatric patient data

PRODUCTIVE SECTOR: Psychiatry and data-driven Pharmaceuticals

PROBLEM DESCRIPTION

There has been a growing demand to create patient registries where the collected patient data is readily applicable for statistical analysis and data mining using advanced methods, like machine learning.

CHALLENGES AND GOALS

The goal of this project is twofold:

1. Provide a possible solution though the integration of a patient registry with the standard EHR patient administration systems.
2. Apply novel data mining and machine learning techniques to investigate the connection of drug medication and the positive and negative symptoms of psychiatric patients.

MATHEMATICAL AND COMPUTATIONAL METHODS

The proposed program focuses on the detailed analysis of good quality medical data of psychiatric patients, collected in the registry, with a wide-range of data mining and machine learning tools.

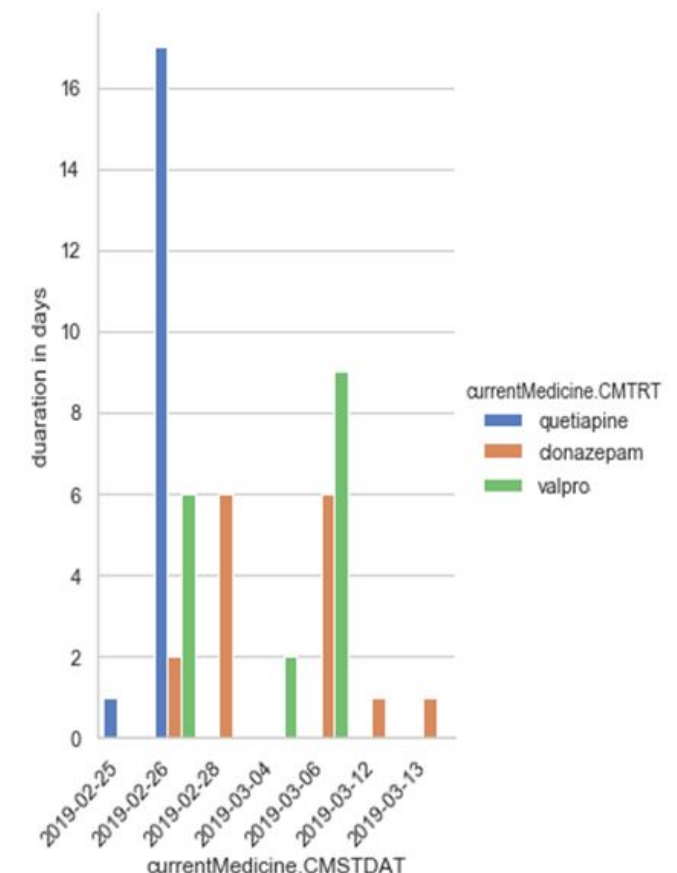
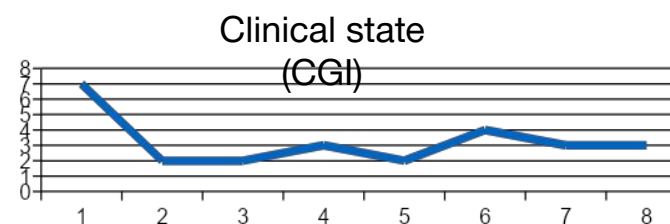
Data collected (2 month pilot study):

- PANSS (medical scale used to measure symptom severity of schizophrenic patients)
- CGI (measures illness severity (CGIS), global improvement or change (CGIC) and therapeutic response)
- Medication (Previous drug history and medication during hospitalization)
- Demographic data

Methods:

- Patient classification (Random forest, XGBoost)
- Correlation analysis
- Longitudinal analysis

Drug	Dose	Start	End	Cause of modification
Aripiprazol tbl.	15 mg/nap	2015.06.12	2015.07.19	dózisemelés elégtelen hatás miatt
Aripiprazol tbl.	30 mg/nap	2015.07.19	2015.08.15	Depot injekcióra átállás rendszertelen gyógyszeresedés miatt.
Aripiprazol depot inj.	400 mg/ 4 hét	2015.08.10	2017.11.10	Relapszus miatt leállítva
Risperidon	4 mg/nap	2017.11.11	2017.11.25	EPS tünetek
Olanzapine	15 mg/nap	2017.11.26	Jelenleg is	



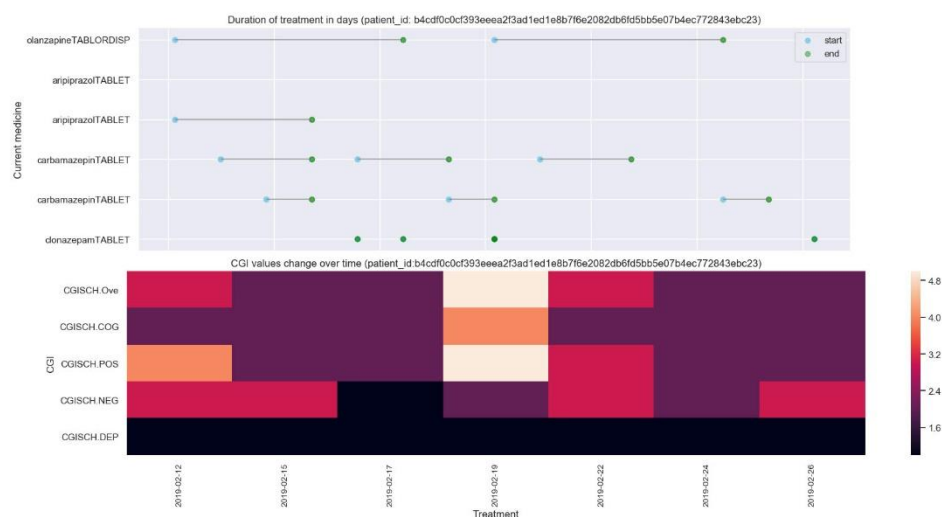
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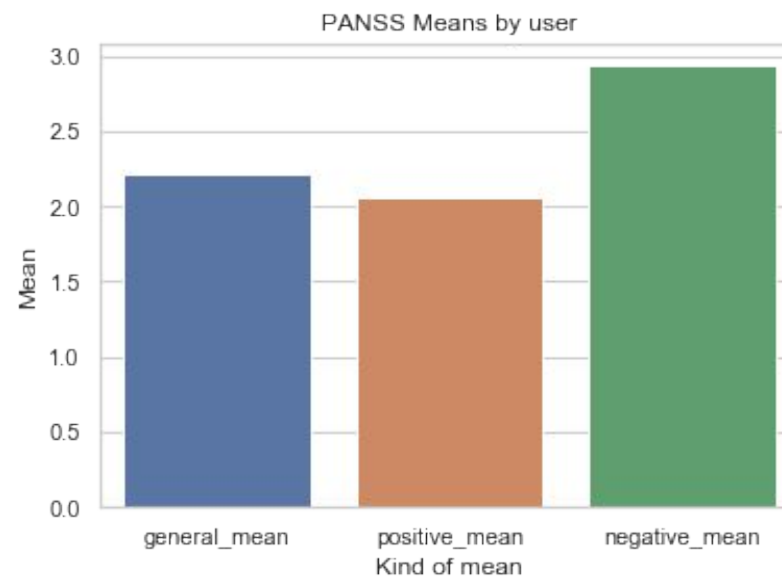
Results and Benefits

- A novel, easy-to-use registry database (with EHR integration -- in progress)
- Significant cost and time reduction in clinical trials (more accurate feasibility assessment, no or less source data verification, easier safety reporting)
- High potential of post-marketing clinical follow up studies
- More accurate drug utilization data and its statistical analysis
- More specific, detailed and customizable data then typical “big data”(e.g. insurance claims, medical records)

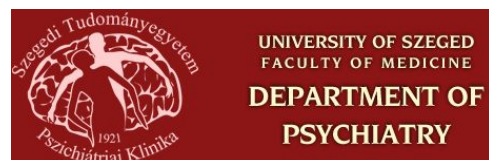
Potential of significant cost and time reduction in clinical trials. More accurate drug utilization data, 2-month drug utilization pilot study with the application of new data mining and machine learning methods.



Treatment vs CGI over time



Population mean of positive and negative symptoms



Takeda
Pharmaceutical Company