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Data analysis plan

Prevalence of palmoplantar psoriasis and pustular psoriasis in children

Administrative details of the data analysis	
Short title of topic	Prevalence of palmoplantar and pustular psoriasis in children
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1. List of abbreviations

MAH	*Marketing Authorisation Holder*
EMA	*European Medicines Agency*
PRAC	*Pharmacovigilance Risk Assessment Committee*

2. Rationale and background

In order to support regulatory discussions on treatment of palmoplantar psoriasis, it is of interest to study the prevalence of palmoplantar and pustular psoriasis in children 0-11 and 12-17 years during the last 10 years.

3. Research question and objectives

The objective of this study is to estimate the yearly prevalence of palmoplantar and pustular psoriasis in children 0-17 years between 2012 and 2021, by age group (0-11 years and 12-17 years).

4. Research methods

4.1. Study design

This will be a descriptive study of yearly disease prevalence in children.

4.2. Setting and study population

The study population will consist of children 0-17 years visiting GP practices. In IQVIA™ Disease Analyzer Germany where paediatricians are also included in the primary care of children, both GP practices and paediatric practices will be included.

4.3. Variables

In the IQVIA™ Disease Analyzer databases a diagnosis of palmoplantar and pustular psoriasis will be identified using the WHO ICD 10 codes L40.1 (Generalized pustular psoriasis) and L40.3 (Pustulosis palmaris et plantaris).

4.4. Data sources

The study will be conducted using version December 2021 of the IQVIA™ Disease Analyzer France and Germany databases, version February 2022 of the THIN® Romania database, and version January 2022 of the IQVIA™ Medical Research Data (IMRD)-UK database. A brief description of each database is given in Annex 1.

4.5. Statistical analysis

4.5.1. Main statistical methods

The prevalence will be calculated using all children that are observable for at least one day during the year in the denominator. Children will be included in the denominator according to their respective age group. Children will be included in the numerator if they had a diagnosis of palmoplantar or pustular psoriasis during the year or earlier. Prevalence will be calculated per 100,000 children.

4.5.2. Sensitivity analysis

No sensitivity analysis will be conducted.

4.6. Quality control

The study will be conducted according to the ENCePP code of conduct (European Medicines Agency 2018).

Standard operating procedures or internal process guidance will be adhered to for the conduct of the study. These procedures include rules for secure and confidential data storage, quality-control procedures for all aspects of the study from protocol development to the reporting of the results.

All documents will undergo at least one round a review by an experienced reviewer, while the results from the statistical analysis will be reviewed.

The quality control of the data is the responsibility of the data holder.

4.7. Limitations

The diagnoses of interest are not know to have been validated in the databases used here or in any healthcare databases. The analysis relies on complete and accurate diagnostic coding which is unlikely to be the case although the extent of misclassification and/or incompleteness is not known.

Changes in healthcare utilisation during the COVID-19 pandemic (2020-present) might affect routine clinical practices and information recording, therefore possible distortions of the "true" background rates due to potential changes in the way patients interacted with healthcare services in the years 2020 and 2021 versus the previous years will be described.

Psoriasis in children in Germany is managed by dermatologists and paediatricians (Pinter et al, 2020). Incomplete recording of the diagnosis cannot be excluded if the patient's psoriasis is managed by a dermatologist.

5. References

Burden-Teh, E., Thomas, K., Ratib, S., Grindlay, D., Adaji, E. and Murphy, R. The epidemiology of childhood psoriasis: a scoping review. *Br J Dermatol* 2016;174: 1242-1257. https://doi.org/10.1111/bjd.14507

Elvina M. Pediatric Psoriasis: Clinical Features and Course. *Open Acc J Bio Sci* 2020; 2(1):207-9 OAJBS.ID.000147.

Pinter, A., Mielke, N., Malisiewicz, B. et al. Management of Paediatric Psoriasis by Paediatricians: A Questionnaire-Based Survey. Dermatol Ther (Heidelb) 10, 671–680 (2020). https://doi.org/10.1007/s13555-020-00390-y

Annexes

Annex 1 - Information on Databases and Healthcare systems included

IQVIA™ Medical Research Data (IMRD) UK

IMRD UK is a primary care database from the UK. GPs play a gatekeeper role in the healthcare system in the UK, as they are responsible for delivering primary health care and specialist referrals. Over 98% of the UK-resident population is registered with a GP, so that GP patient records are broadly representative of the UK population in general. Patients are affiliated to a practice, which centralizes the medical information from GPs, specialist referrals, hospitalizations, and tests.

IQVIA™ Disease Analyzer Germany

IQVIA™ Disease Analyzer Germany collects computerised information from specialised and general primary care practices throughout Germany since 1992. Around 3% of general practitioners (GP) practices are included, which covers all patients consulting a practice. Data from IQVIA™ Disease Analyzer Germany have been shown to be reasonably representative of German healthcare statistics for demographics and certain diseases and is considered one of the largest national medical databases worldwide. IQVIA™ Disease Analyzer Germany includes more than 2,500 practices and 3,100 physicians (13 speciality groups) representing over 15,000,000 patients. This database used to be named IMS® Germany and some use of this terminology may persist.

The quality of IQVIA™ Disease Analyzer data is ensured by a series of continuous QA controls and data refinement. These include checking incoming data for criteria such as completeness and correctness, (e.g. linkage between diagnoses and prescriptions), and standardizing certain data values such as laboratory test results in order to enable reliable analysis.

IQVIA™ Disease Analyzer France

IQVIA™ Disease Analyzer France collects anonymised patient medical records since 1997 through a representative panel of GPs. The physician sample represents approximately 2% of physicians and is weighted by age and gender of the physician, doctor region and the SNIR of the physician (National Official Indicator of the GP volume of activity in terms of visits and consultations). Some 99% of the French population is insured, but there are differences regarding level of coverage. IQVIA™ Disease Analyzer France includes around 1,000 GPs and represents more than 4,000,000 of patients and considered representative for the French population. This database used to be named IMS France and some use of this terminology may persist.

The quality of IQVIA™ Disease Analyzer data is ensured by a series of continuous QA controls and data refinement. These include checking incoming data for criteria such as completeness and correctness, (e.g. linkage between diagnoses and prescriptions), and standardizing certain data values such as laboratory test results in order to enable reliable analysis.

The Health Improvement Network (THIN®) Italy

In THIN® Italy data collection started in 2000 and this database is currently able to provide clinical monitoring data of anonymised patients managed by 500 GPs in primary care (including patients' history). The data source of THIN® Italy is electronic health care records. The entire database reaches 900,000 patients (active and non-active), from which 500,000 are currently actively followed. In order to be representative at national and macroregional level, physicians have been recruited in accordance with their universe distribution in terms of geography, age and gender.

THIN® is an unobtrusive European medical data collection scheme that collects anonymized patient data from the Electronic Health Records of GPs and specialists, including information on patient's diagnoses, test results and medication. The databases follow a very strict anonymization process. In all countries patients are informed about the collection and anonymization of the data and are able to opt out, in which case no data are subsequently transmitted to the THIN database.

The Health Improvement Network (THIN®) Romania

THIN® Romania is a primary care healthcare database, including only General Practitioners (574 GPs). The source of data is electronic health care records. Enrolled GPs and their patients are representative of the whole Romanian population in terms of location, demographics and prevalence from the point of view of main chronic health pathologies. Data collection started in 2012.

In Romania, the insured population (background sampled population) numbered 17.1 million individuals (data from 2012). Among these, 8.5 million individuals benefited of healthcare services, in the public system. The number of GPs who worked in the public healthcare system, in 2017 was aproximately 11,000 physicians. They recorded 76 million consultations and issued 71 million prescriptions (data from 2017). The number of deceased patients was of 297,000 individuals, and number of newborns in 2020 was of 179,000 individuals.

THIN® is an unobtrusive European medical data collection scheme that collects anonymized patient data from the Electronic Health Records of GPs and specialists, including information on patient's diagnoses, test results and medication. The databases follow a very strict anonymization process. In all countries patients are informed about the collection and anonymization of the data and are able to opt out, in which case no data are subsequently transmitted to the THIN database.

The Health Improvement Network (THIN®) Spain

THIN® Spain is mainly a primary care healthcare database, including practitioners (GP), specialists and pediatricians & nurses. It contains data from approximately 2,000 GPs and 2,400 specialists (cardiology, pulmonology, urology, etc.). THIN® Spain also includes partial activities related to the hospital. THIN® Spain is globally representative of the whole national demographics and prevalence on the main chronic health pathologies. THIN® Spain includes 3,000,000 individuals out of the overall population. Among these, 1,050,000 are active in the previous year and 1,800,000 are active from 2014. Number of deceased patients globally varies between 8 and 9 thousand individuals per year, and number of new-borns ranges between 10 and 12 thousand individuals. New patients are automatically included into the database, and deceased patients identified in a specific field.

THIN® is an unobtrusive European medical data collection scheme that collects anonymized patient data from the Electronic Health Records of GPs and specialists, including information on patient's diagnoses, test results and medication. The databases follow a very strict anonymization process. In all countries patients are informed about the collection and anonymization of the data and are able to opt out, in which case no data are subsequently transmitted to the THIN database.

The THIN® Spain Database has been approved by two Ethics Committees, one from the Community of Madrid (Hospital Ramón Cajal) and one from the Community of Catalonia (Hospital Clinic de Barcelona). These ethics committees reviewed the data collection, protection, and anonymization processes and positively approved THIN® Spain for observational research of medical products (upon protocol submission).

Annex 2 – Codelists

WHO ICD 10 codes used for diagnosis (IQVIA™ Disease Analyzer and THIN®)

Condition	WHO ICD 10 code	WHO ICD 10 code description
Palmoplantar pustulosis	L40.3	Pustulosis palmaris et plantaris
Pustular psoriasis	L40.1	Generalized pustular psoriasis
Any psoriasis	L40 (all subcodes)	Psoriasis

Read codes used for diagnosis (IMRD UK only)

Read code	Description
L40.1 Generalized pustular psoriasis	
M161D	Pustular psoriasis
M143	Impetigo herpetiformis
L40.3 Pustulosis palmaris et plantaris	
M07y0	Pustular bacterid
M161A	Psoriasis palmaris
M161B	Psoriasis plantaris
M166	Palmoplantar pustular psoriasis
EMISNQPA160	Palmoplantar pustulosis
^ESCTAC255528	Acute palmoplantar pustular psoriasis
^ESCTCH294145	Chronic palmoplantar pustular psoriasis
^ESCTPU294148	Pustular psoriasis of palms and soles