

# Case report: cost-benefit of earlier diagnosis in a patient with Behcet's disease using CTV3 codes at primary care UK

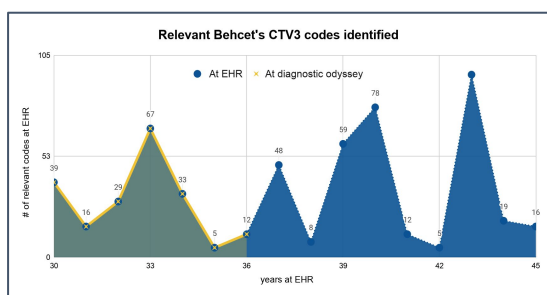
Orlando Buendia<sup>1</sup>, Rudy Benfredj<sup>1</sup>, Timothy Halford<sup>1</sup>, Isabella Rustiglioni<sup>1</sup>, Peter Fish<sup>1</sup>, Will Evans<sup>1</sup>, Renate Apse<sup>1</sup>, Nicolas Aussel<sup>1</sup>, Connor Toal<sup>1</sup>, Valeria Garzon<sup>1</sup>.  
<sup>1</sup>Mendelian Ltd, London, United Kingdom

## Introduction

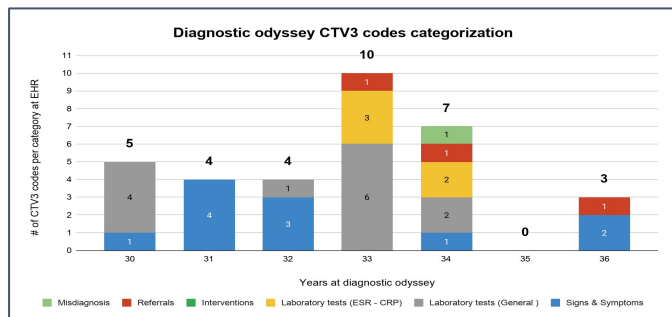
- It is challenging to build robust economic models for rare diseases since few epidemiologic and economic studies exist<sup>1</sup>.
- We sought to establish a cost-benefit model for earlier diagnosis using real-world data collected from primary care Electronic Health Records (EHR) using Clinical Terms Version 3 (CTV3) codes<sup>2</sup>.
- Our aim was to determine the healthcare utilisation and costs saved by making an earlier diagnosis of a patient with Behcet's disease.

## Methods

- We analysed the Electronic Health Record (EHR) of a patient with Behcet's disease, who could have been diagnosed four years earlier by using digital encoding of an established clinical guideline<sup>3</sup>.
- We extracted the Clinical Terms Version 3 (CTV3) codes from their primary care EHR. We then calculated the time to diagnosis. This was defined as the first time a coded entry of a clinical feature associated with Behcet's disease was encoded until the time that a diagnosis was recorded.



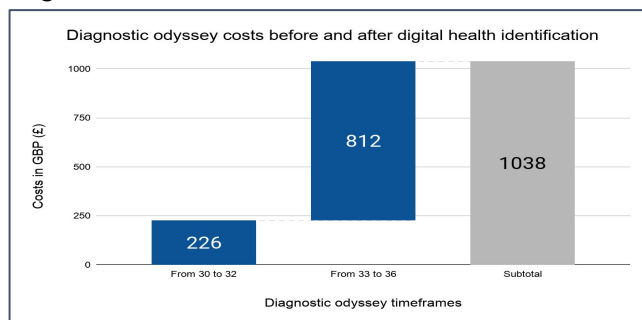
- We identified all the codes at the diagnostic odyssey that could be related to Behcet's disease (GP visits, signs & symptoms, tests, referrals, interventions and misdiagnosis).



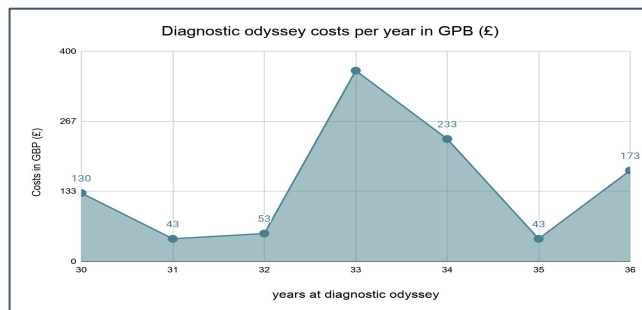
- We assigned for each identified code a cost attributed to the National Health Service (NHS)<sup>4</sup>. Then we calculated the potential total health service utilisation and the possible cost of the diagnostic odyssey.
- We compared costs incurred during the patient's real diagnostic odyssey (six years), to the shorter journey to diagnosis (two years) had the digitally encoded diagnostic criteria been used.

## Results

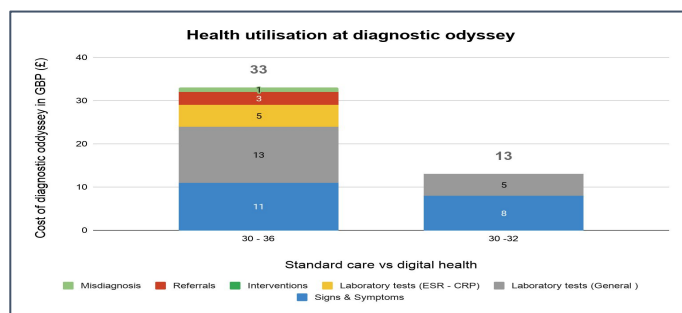
- Total healthcare costs over the 6 year period were £1038. Of which £812 was incurred as costs during the 4 years after the earlier potential diagnostic date had the digital diagnostic criteria been used, a 78% reduction.



- Annual healthcare costs were highest in the 4 years prior to diagnosis.



- This saving in health care utilization included the potential avoidance of 3 unnecessary referrals, investigations and 1 misdiagnosis.



## Discussion

- Data from primary care EHR allows the stratification of healthcare resources and calculation of costs.
- This study demonstrates that developing economic models at an individual patient level can help quantify the cost savings of earlier diagnosis in Rare Diseases.
- Further work is needed to replicate these findings in other cases and diseases.

## References

- <sup>1</sup> Sakane T, Takeno M, Suzuki N, Inaba G. Behçet's disease. *New England Journal of Medicine* 1999; 341(17): 1284–1291. Doi: 10.1056/NEJM199910213411707
- <sup>2</sup> NHS Digital. 2020. *Read Codes - NHS Digital*. [online] Available at: <<https://digital.nhs.uk/services/terminology-and-classifications/read-code>>