# Understanding Fabry in families:
# Preliminary findings from a global survey

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## Introduction

- Fabry disease is a multi-systemic, X-linked lysosomal disease arising from a deficiency of the enzyme alpha-galactosidase, that can affect multiple generations of the same family
- Pedigree analysis (the testing of relatives following a diagnosis) is a powerful tool to aid in the diagnosis, establish inheritance patterns, and ensure the early detection of potentially affected relatives[1,2]
- A discussion between Fabry International Network (FIN) members highlighted a lack of awareness around availability of pedigree testing at a country level; this was supported by the limited number of publications on pedigree testing for Fabry disease in the literature
- A study was designed to collect data on the pathway to diagnosis and the availability of pedigree testing and genetic counselling across FIN member countries

## Aims

- To gain insight into pathway to diagnosis and the accessibility of pedigree testing and genetic counselling around the world, with the goal of improving services

## Methods

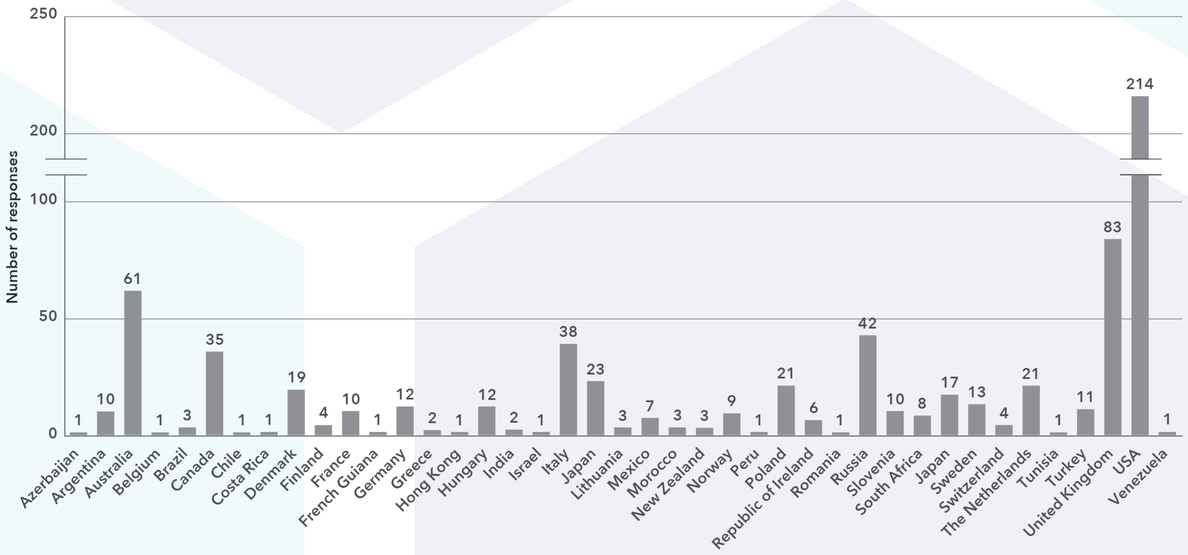
- The online survey was open to any individual (≥18 years), or a parent/carer of a child, with a diagnosis of Fabry disease
- Individuals were recruited by individual country FIN patient organisations (n=52) via an email invitation with a link to the appropriate language(s) for their members*
- Consent was sought from all participants
- The survey consisted of 40 questions
- Here we present results from the total study population

*The survey was available in 22 languages

## Results

- In total, 717 responses were received from 41 countries (Figure 1), with the most responses coming from the USA, UK and Australia

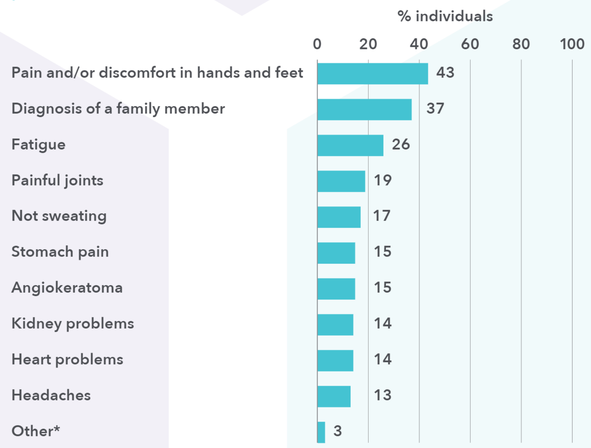
Figure 1. Number of responses received by country




## Diagnosis with Fabry disease

- **Mean (SD) age at diagnosis was 33.0 (15.7) years (range 0–71 years)**
  - 62% were aged between 16–45 years at diagnosis
  - Diagnoses ≤15 years and >45 years were rarer (15% and 22%, respectively)
- **More diagnoses (54%) followed the diagnosis of a family member, than an individual experiencing symptom(s) (46%)**
- Pain and/or discomfort in the hands/feet (43%), the diagnosis of a family member (37%), and fatigue (26%) led to the initial visit to a primary care doctor (Figure 2); often more than one symptom led to the visit

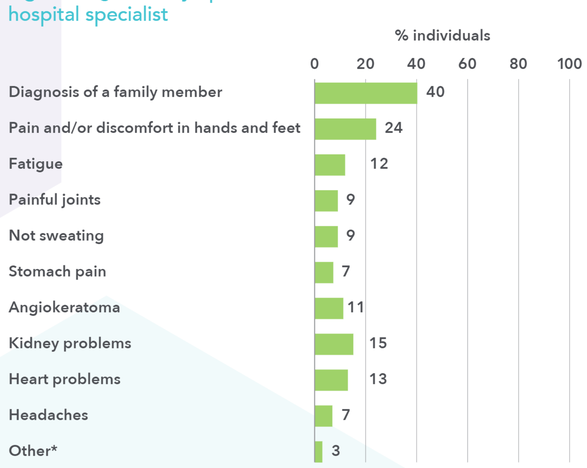
Figure 2. Signs and symptoms that led to initial visit to a primary care doctor




*Other 'signs and symptoms' included muscle pain, hypertension and facial swelling

- Most referrals to a hospital specialist followed the diagnosis of a family member (40%), pain and/or discomfort in hands and feet (24%) and kidney problems (Figure 3); often more than one symptom led to the referral

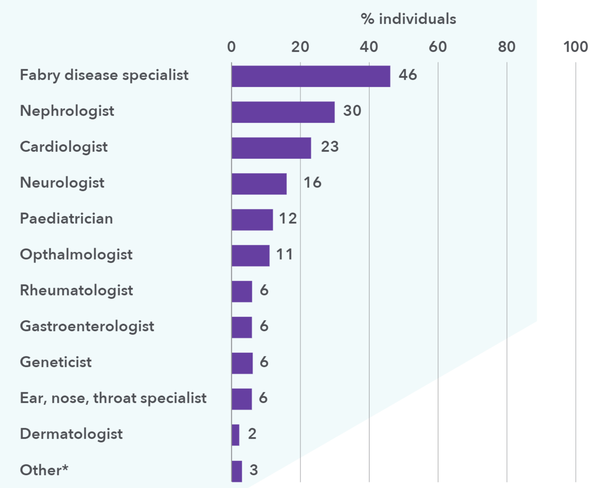
Figure 3. Signs and symptoms that led to a referral to a hospital specialist




*Other 'signs and symptoms' included limb paralysis, weight issues, pregnancy complications, psychosis, dystonia and unable to stand

- Hospital referrals were made to a Fabry disease specialist (46%), a nephrologist (30%), or a cardiologist (23%) for the majority, however some respondents had been referred to more than one specialist for their symptoms (Figure 4)

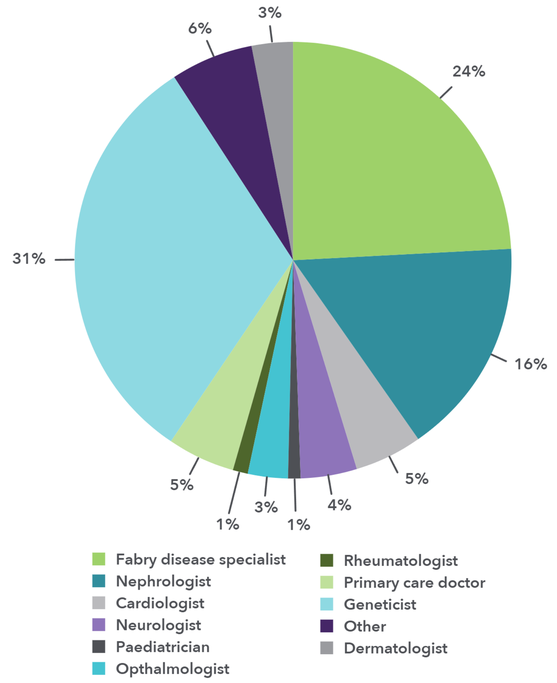
Figure 4. Referrals to hospital specialist




*Other 'specialist referrals' included psychiatrist, endocrinologist, orthopaedic specialist, neuromuscular specialist and internal medicine specialist

- **Mean (SD) time to diagnosis was 9.5 (13.5) years (range 0–63 years)**
- Whilst most diagnoses (34%) took place within a specialist hospital setting, other diagnostic settings included regional hospital (21%), local hospital (15%), primary care (6%) or university hospital (3%)
- **Respondents travelled far to be diagnosed; mean (SD) distance travelled to place of diagnosis was 230.5 (698.3) km (range 0–6000 km)**
- Of those who answered, diagnoses were made by either a genetic specialist (31%), Fabry specialist (24%), or nephrologist (16%) for the majority (Figure 5)

Figure 5. Physicians who diagnosed Fabry disease




*Others diagnosing Fabry included a haematologist, a neuromuscular specialist, a medical student and an emergency room doctor who had recently attended Fabry disease training

## Fabry disease awareness in families

- **Prior to their personal diagnosis, only 34% were aware of Fabry disease in their family**
- Following a personal diagnosis, 81% were aware that their family members had since been tested for Fabry disease
- **Around two-thirds of respondents (67%) had undergone pedigree analysis**

## Fabry inheritance patterns

- **Just over half (53%) had been offered genetic counselling; of those who were offered this, 45% accepted**
- Most (92%) had received an explanation regarding the inheritance patterns of Fabry; for 85% the explanation was given within six months of diagnosis
- Explanations generally came from a geneticist (35%) or a hospital specialist (32%); 57% received take home information about what they had been told

## Conclusions

- Working with patient organisations across FIN, this study achieved a large sample and provided global insights into pathway to diagnosis, and the availability of pedigree testing and genetic counselling, for individuals with Fabry disease
- For the majority of our study population, diagnosis happened between the age of 16 and 45 years, and followed the diagnosis of a family member
- Two thirds of our study population had undergone pedigree analysis; only half had been offered genetic counselling
- These findings highlight:
  - The importance of pedigree analysis for an earlier diagnosis of potentially affected family members
  - The limited access to genetic counselling following a diagnosis
- Further analysis of the data collected at a regional and a country level may identify areas that could benefit from additional support to improve availability and access to these services

## Acknowledgements

Christine Lavery, MPS Society, UK, the originator of this study

Rebecca Brandon, Fabry Disease Advocacy Support Officer, MPS Society UK, for her input into the survey design

The FIN organisations who distributed the survey to their members; without their help this study would have not been possible

GfK Switzerland who completed the data analysis

## References

1. Gutiérrez-Amavizca BE et al. 2014.Genet Mol Res; 13:6752.
2. Laney DA et al. 2008. J Genet Couns; 17:79.

## Disclosure

Shire awarded the MPS Society (UK) a grant to undertake this research; the MPS Society commissioned MPS Commercial* to carry out this study

**Poster available at mpscommercial.com/publications**

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