



NETIMIS

CASE STUDY

The Simulation of Giant Cell Arteritis Patient Care Pathway

Client: The TARGET Consortium

Overview

This case study has been completed as part of a University of Leeds undergraduate student project in collaboration with The MRC TARGET Consortium and X-Lab Ltd. It will detail how NETIMIS was used to simulate and model the giant cell arteritis (GCA) patient care pathway to enable the understanding of the current challenges and inefficiencies involved with existing pathways for GCA diagnosis. This will then facilitate exploration of potential innovative solutions that can be adopted to allow for a more efficient diagnostic pathway.

The TARGET (Treatment According to Response in Giant Cell Arteritis) Consortium is a partnership that was formed upon receiving an award of a Partnership Grant from the Medical Research Council (MRC). TARGET's primary aim is to create an in-depth understanding of GCA pathogenesis to help reduce steroid toxicity and therefore improve outcomes for patients with GCA.

About GCA

Giant cell arthritis is a rare chronic inflammatory condition of blood vessels (vasculitis) that affects large and medium-sized arteries. Remodelling of the blood vessel walls following inflammation reduces blood flow which causes the patients to suffer from symptoms such as:

headaches, tenderness of the scalp, jaw aches and chewing problems and visual impairment.

Challenges

Although, GCA exclusively occurs in individuals over 50 years of age, the majority of patients present in their 7-8th decades, with females having double the chance of being affected compared to men. Due to the rarity of this disease and the age group of the patients, the symptoms they display can often be mistaken for the normal age-related symptoms or due to other diseases they have developed. If GCA is not diagnosed quickly and is left untreated, it can lead to visual loss, blindness, or in worst cases a stroke. For this reason, patients are treated with steroids as soon as the diagnosis is considered.

This creates other challenges, since many of the tests used to make a diagnosis can return to normal with steroid treatment, steroids therefore significantly impact the sensitivity of the diagnosis and it is essential that diagnostic tests are performed within a few days of starting treatment.

How NETIMIS Helped

NETIMIS proved to be a simple and effective tool for modelling the patient care pathways. The models created were very useful in enabling an in-depth understanding of the process with the aid of visuals and this helped determine inefficiencies and ways in which they could be improved.

The models were created through investigation of how GCA is currently diagnosed in Leeds, from the perspective of Consultants involved at different stages of the clinical pathway and several iterations of the current state process were created and shared with the stakeholders until the model was signed off as complete for meeting the requirements and presented the most accurate real-life pathway. This was challenging, since patients may present to their general practitioner or accident and emergency department and from there may be referred to rheumatology, ophthalmology, neurology, general medicine, medicine for the elderly or vascular surgery departments.

This tool enabled all stakeholders of the project to really engage and understand what takes place within their hospitals.

Conclusion

The work completed as part of this project can be used as a baseline for conducting further research on the GCA diagnostic pathway. The models proved effective for communication amongst project stakeholders and for creating an in depth understanding of the processes in place. They can also be used to model the pathway in other centres, to allow for a more in depth comparative study. To conclude, NETIMIS simulations are an effective method for conducting analysis to improve a business case for reorganisation of clinical services to optimise clinical diagnostic and management pathways.