Title: Assessing the Landscape and Charting Paths: UK Neurology Trainees' opinions on neuroinflammation subspecialty

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Abstract

Therapeutics of neuroinflammatory disorders including multiple sclerosis is one of the fastest growing areas in neurology. However, pressures on higher specialty training in neurology together with an expanding curriculum have led to challenges in adequately preparing trainees for a subspecialist career. In this study we set out to understand current perceptions and barriers to training in neuroinflammatory disorders among neurology trainees in the UK. A structured questionnaire was used to assess trainees' perspectives on training opportunities and career aspirations. Findings reveal significant gaps in training, including insufficient training opportunities, lack of mentorship, and concerns about managing complex treatment regimes. We used these findings to develop structured action points with aim of improving training and retention in this subspecialty. These include early exposure to subspecialty experiences, enhanced mentorship, and equal access to training opportunities regardless of geographical location. Our findings underscore the need for further curriculum development in neurology training, potentially combining early support with dedicated fellowships later in training, in order to ensure sustainability of neuroinflammation as a subspecialty and to meet the growing demand for expertise in MS and related conditions.

Background

Over the past decade there has been substantial growth in understanding the underlying pathophysiology of neuroinflammatory diseases including MS. Alongside a better appreciation of the mechanisms underlying disease susceptibility and activity, a rapid increase in the number of disease modifying treatments (DMTs), particularly in MS has resulted in meaningful change in outcomes and quality of life for patients.

In order to ensure continuing development and safety in this field, it is vital that prescribing clinicians undergo comprehensive training. This training needs to encompass accurate diagnostic evaluation, an understanding of factors that enable personalisation of treatment, proficiency in recognizing and managing immunotherapy-related side effects, and a practical appreciation of the importance of multidisciplinary collaboration. Pressures on higher specialty training resulting from increased therapeutic complexity across many neurological diseases alongside reforms to training have led to challenges in preparing trainees for a subspecialist career.

After graduation from medical school, UK doctors usually undertake at least two years of foundation training in a range of medical and surgical specialties. Those wishing to train in Neurology first need to develop competency in general medicine during Internal Medicine Training (IMT), before entering neurology Specialist Training (ST)(Figure 1). Recent revisions to the physician training system due to the introduction of shape of training in the UK have resulted in reduced time allocated to neurology specialty training[1]. The recent integration of general internal medicine and stroke competencies within neurology higher specialist training has diminished overall time available for subspecialty experience. As a result, many trainees struggle to gain exposure beyond mandatory curriculum requirements. This poses a growing challenge for subspecialty areas such as MS and neuroinflammation. Together with variability in access to training opportunities with marked geographical clustering, restricted out of program experience and decreasing trainee geographic mobility these factors have the potential to lead to significant inequalities in subspecialist care[2]. There is also a evolving risk of expertise dilution, with fewer trainees gaining requisite training to practice independently and confidently as subspecialists at the time of obtaining their certificate of completion of training (CCT).

In response to these challenges, we aimed to evaluate the current state of training in neuroinflammation and understand attitudes of neurology trainees towards future careers in neurology. By surveying neurology trainees across the UK, we sought to identify areas for improvement in training.

Methods

We developed a structured questionnaire to collect information about training opportunities and trainees' views on MS and neuroinflammation training in the UK. This was electronically disseminated to current neurology trainees across the UK identified via the Association of British Neurologists regional trainee network (ABNT). Trainees were asked to provide information about the geographical location of their training and current stage in the neurology training program. We explored career aspirations, specifically questioning trainees whether they were currently considering pursuing a career in MS and neuroinflammation. For those not considering this career path, we sought to establish reasons for their decision. Trainees were asked to select their top/all relevant reasons. Five common reasons were provided, based on trainee engagement during survey development, and a free text box was also available. The survey, active from March 2023 to August 2023, incorporated periodic reminders to enhance participation.

Results

Out of 288 UK trainees identified via the ABN trainee database, including those out of the programme for research, 75 (26%) completed the survey. Responses covered all devolved nations (Scotland 12%, Wales 4%, Northern Ireland 4%, England 80%), in keeping with trainee distribution. Two thirds of respondents were male (67%), representative of the overall gender balance of neurology trainees. Trainees from across all training grades were represented, with 20% of respondents in the early stages of specialist training (ST3/ST4), 46% in the middle stage (ST5/6), and 17% in the final year of training (ST7). A further 17% of respondents were out of programme for research.

Respondents were asked to rank key factors influencing their choice of subspecialty. The top three factors identified were clinical attachment or experience as a trainee (35%), mentoring and support from a colleague (27%), and research interest in the field (25%) (Figure 2; n=71 respondents).

When asked about subspecialty interest, 13 (18%) expressed a definite preference for a career in MS and neuroinflammation, whilst 37 (49%) indicated they would not pursue this path and 25 (33%) were unsure (Figure 3). Approximately half (53%) opting against this career path were mid-training (ST5-6), while 20% were in early training (ST3-4). Within each training grade 47% of ST3/ST4 and 57 and 58% of trainees within the ST5 and ST6 grades responded that they would not consider a career in MS and neuroinflammation (Figure 4). Thirty-four respondents provided free text comments on why they would or would not pursue a career in MS and neuroinflammation (representative comments are clustered by theme in Table 1).

Lack of exposure to the sub-specialty experience (21%), lack of mentorship (10%) and large number of new disease modifying treatments and complexity with their use (13%) were cited as the main reasons for not choosing this subspecialty (Figure 5). These reasons did not differ substantially between trainees at early (ST3-ST5) and later stage of training (ST6-ST7). Some respondents additionally highlighted barriers including the absence of diversity in leadership roles, and extensive on-call or inpatient work during training hindering their ability to develop special interests. A lack of awareness regarding special interest groups for MS and neuroinflammation was also reported.

For those inclined towards a career in MS and neuroinflammation, the main influencing factors included experience of that sub-specialty as a trainee (41%), research interest in the field (35%), and the presence of a senior mentor with expertise in MS and neuroinflammation (30%).

Discussion

In the first national neurology trainee survey focusing specifically on MS and neuroinflammation in the UK, trainee views on training in neuroinflammation and future career planning were explored. We have demonstrated potential gaps in the UK neurology training system, which could pose a threat to the future of neuroinflammation as a subspeciality. If there are not enough experts, patients will be unable to obtain an accurate diagnosis, let alone safely access effective treatments. Several areas were identified that require further attention.

One of the key areas seems to be allowing trainees to explore subspecialty interests at an early stage and providing opportunities for them to develop experience and research with the constraints of shape of training. Ensuring subspecialist clinic exposure in the early years of training, a formative time in terms of trainees developing their longer-term interests, appears to be crucial. Over 60% of the survey respondents reported lack of exposure to adequate MS and neuroinflammation

experience as a trainee. Close to a third of trainees also reported lack of opportunities to access consistent subspecialist mentorship, which appears to be important in enabling trainees to develop future interests. These findings highlight the need for access to meaningful support alongside broad opportunities within neuroinflammation early in training, with subsequent access to more in depth and focussed training for those who are keen to pursue a subspecialist career.

The national demand for care in neuroinflammation is such that the future curriculum must build the capacity to impart expertise across the spectrum of neuroinflammatory conditions. Training reforms linked to Shape of Training will promote generalists but may have a detrimental impact on subspecialist training. The emphasis on producing doctors capable of delivering holistic care is welcome, as is the new curriculum focusing on high level capabilities with a simplified assessment structure. The neuroinflammation curriculum within Higher specialist training addresses major training needs for general neurologists, however this appears to be insufficient to instil confidence for many trainees to practice as independent subspecialists. Expanding the curriculum at this pre-CCT stage is not feasible given competing demands. An ABN accredited neuroinflammatory curriculum has been developed and provides a suitable matrix to cover clinical development during dedicated fellowships [10].

There are regional disparities in the number of trainees in research with higher numbers in regions such as London [4]. Consultant recruitment is also more likely to be successful within London, and in general is more successful in neuroscience centres. To address healthcare inequities resulting from unequal distribution of subspecialists, trainees must have equal access to subspecialist training regardless of geographical location. Lack of predictable funding is a significant issue, and whilst ABN fellowships were set up to try to address this, they remain relatively limited in number and do not specifically address the issue surrounding regional inequity. This lack of opportunity may be contributing to an overall decline in the number of trainees who take time out of programme for clinical and research fellowships and may contribute to geographic disparities. [8,9]

We noted the relatively low proportion of female respondents. However, this appears to be representative of the proportion of females within neurology training, and in keeping with previously published reports [3], data from the 2020 ABN Trainees Survey and Health Education England database. There has been considerable work within the ABN to promote equality, and it is hoped that over time the gender balance amongst neurologists will improve. The survey also found that the percentage of trainees who would not consider a career in MS is much lower at ST7 level, this may relate to responder bias.

In conclusion, the first national neurology trainee survey focusing on MS and neuroinflammation in the UK has unveiled critical challenges in training and future career planning. The survey identified significant gaps, including a lack of exposure to neuroinflammation opportunities during neurology higher specialist training, insufficient mentorship, and concerns about working with unmanageable caseloads and complex disease modifying treatment regimes. Addressing these issues is challenging given multiple demands during training and requires strategic planning across higher specialty training. This is vital for both high quality training and to enable sustainability of neuroinflammation as a subspecialty.

Proposed actions to engage trainees in neuroinflammation

Early engagement and planning: Facilitate early exposure to subspecialist clinics, allowing trainees to develop long-term interests from beginning of their training.

Enhancing Training and Mentorship Opportunities: Develop and promote MS and neuroinflammation clinical and research training fellowships along with mentorship opportunities to enable trainees to access comprehensive experience throughout training.

Adoption of the ABN accredited fellowship curriculum: expansion ABN-accredited post/peri CCT training fellowships will provide further experience in aspects of the extended neuroinflammation curriculum (10).

Enhancing Training through Comprehensive Subspecialty Assessment: Incorporating subspecialty content at every stage of assessment during training ensures that both trainees and training programs focus on all relevant and critical areas. It is essential to consider the integration of both summative and formative assessment structures to create well-rounded and effective training.

Regional Equity and Distribution: ensure subspecialty and research training opportunities are geographically distributed to reduce disparities and to avoid geographical clustering of clinical training fellowship opportunities. Encourage collaboration and flexibility between centres to ensure well-rounded training opportunities within subspecialty training.

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Table 1 Respondent free-text comments regarding factors impacting decisions on a career in MS and neuroinflammation

Those that responded "Yes"
"**My** experience as an MS clinical fellow has provided me with a deeper understanding of treatment nuances, which has significantly increased my confidence in pursuing a career in neuroinflammation" "Having early exposure to a MS research fellowship meant that I was able to weigh and pros and cons and decide to progress into the field with great confidence".
Those that responded "No"
"There are many new disease modifying treatments and this is complex". "Explore to subspecialist training is very variable from one center to another and does not very often expose us a trainees to the full range of disease related complexities".
Those that responded "May be"
"The field has becoming increasing more complex and having a senior mentor who has an MS and neuroinflammation interest will help me develop further confidence".

Figure 1

UK higher speciality training programmes before (1a) and after (1b) introduction of shape of training

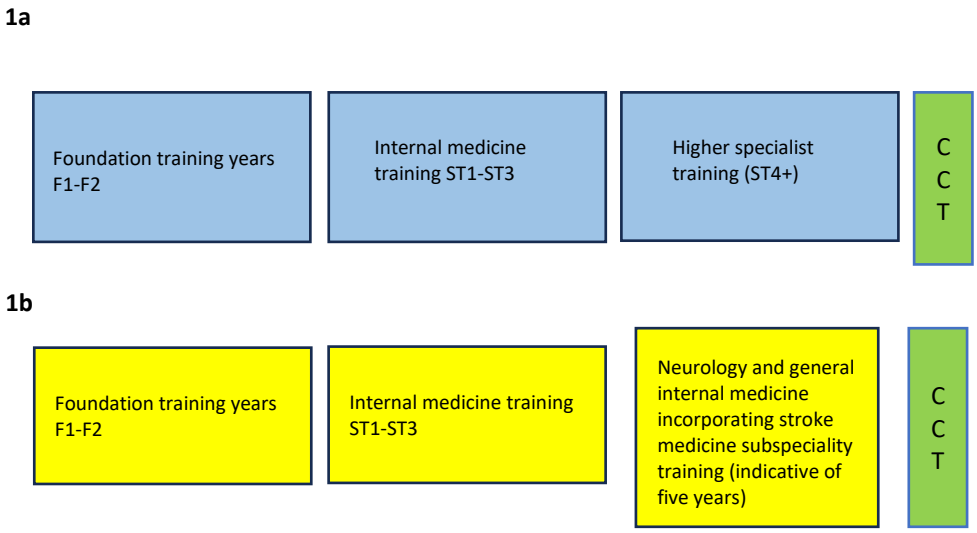

Figure 2: When choosing a subspeciality what plays a role (please rank 1-5)

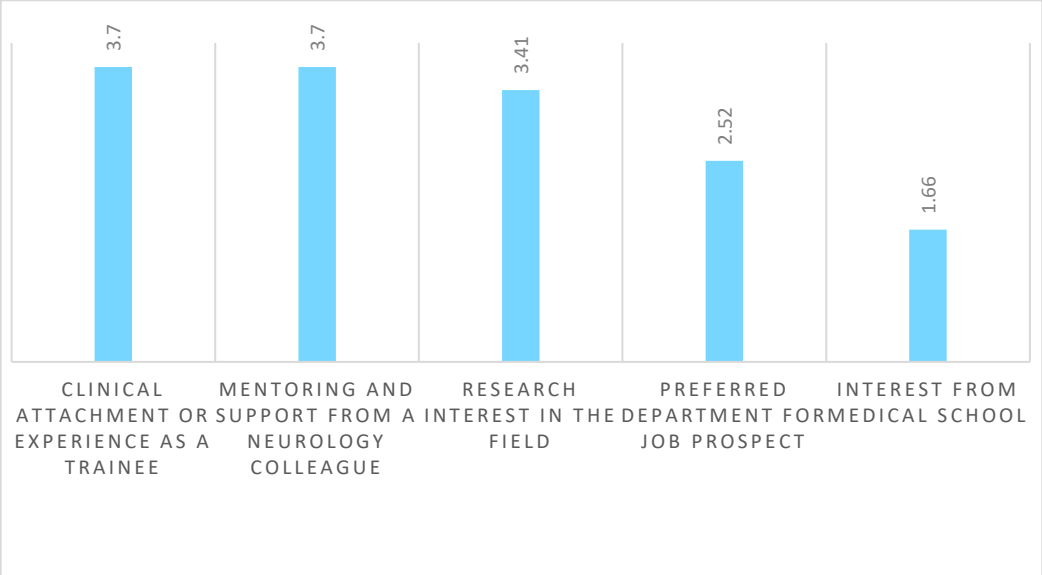

Figure 3: MS and neuroinflammation as a preferred subspeciality

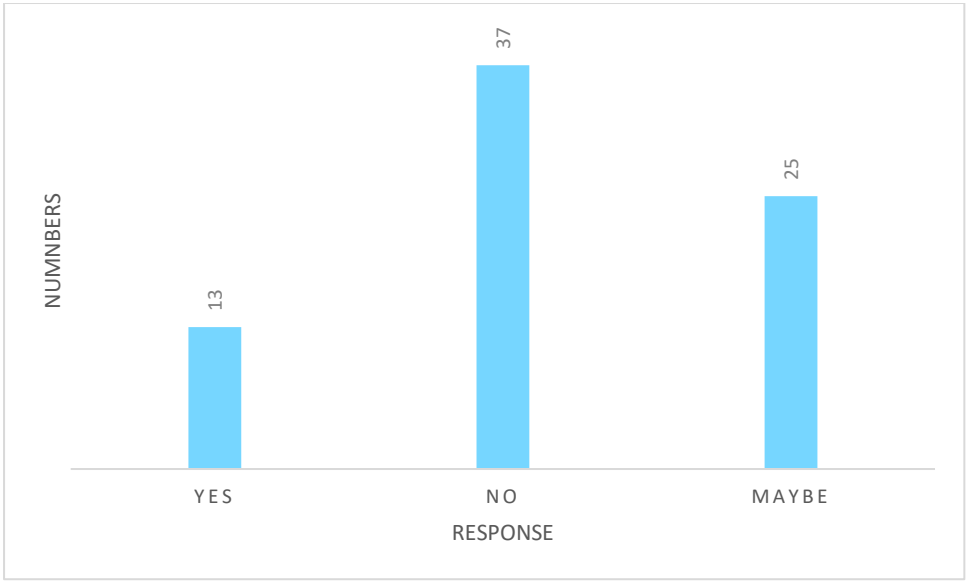

Figure 4: Percentage of trainees within each grade who responded that they would not consider a career in MS and neuroinflammation

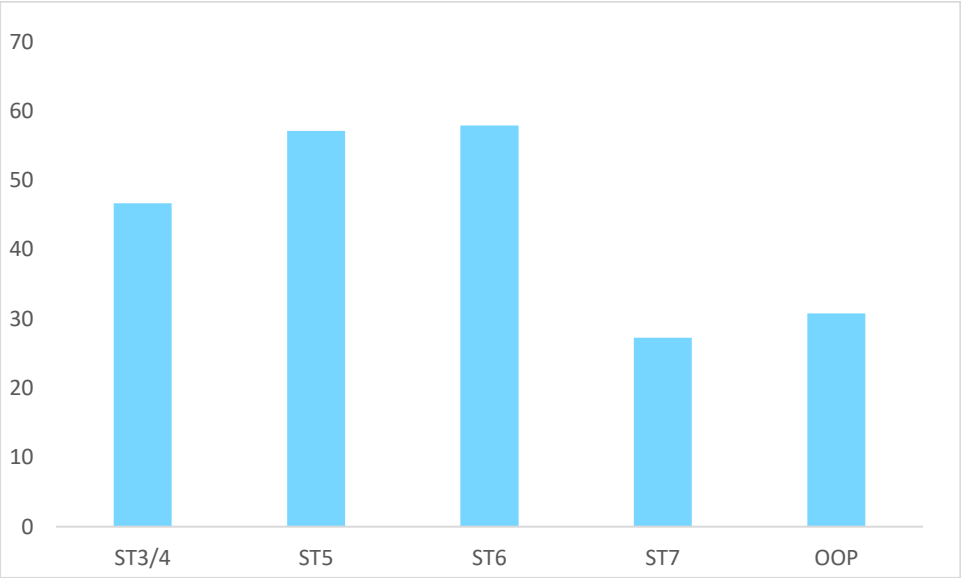

Figure 5: Reasons given by trainees who responded that they will not choose a career in MS and neuroinflammation (multiple answers possible)