

Brief Communication

Frequency and factors associated with emergency department attendance for people with epilepsy in a rural UK population



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ABSTRACT

Attendance at UK Emergency Departments (EDs) for people with epilepsy (PWE) following a seizure can be unnecessary and costly. The characteristics of PWE attending a UK rural district ED in a 12-month period were examined to foster better understanding of relevant psycho-social factors associated with ED use by conducting cross-sectional interviews using standardized questionnaires. Of the total participants ($n = 46$), approximately one-third of the study cohort attended ED on three or more occasions in the 12-month study period and accounted for 65% of total ED attendances reported. Seizure frequency and lower social deprivation status were associated with increased ED attendance while factors such as knowledge of epilepsy, medication management, and stigma were not. Similarities in frequency of repeat attendees were comparable to a study in urban population but other factors varied considerable. Our findings suggest that regular ED attendees may be appropriate for specific enhanced intervention though consideration needs to be given to the fact that population characteristics may vary across regions.

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1. Introduction

There are approximately 100,000 epilepsy-related attendances at UK Emergency Departments (EDs) annually, around 40,000 of which result in an admission [1]. The cost of providing emergency care alone is estimated to be more than £56 million [2] with people with epilepsy (PWE) accounting for 1.4% of all UK hospital admissions [1]. A large proportion (60%) of the ED visits does not result in admission as they are seen as clinically unnecessary [3]. Of those admitted, the larger clinical value for many is questioned [4]. There is scope to consider factors influencing ED attendance to help inform strategies to improve community care and reduce ED dependence and subsequent cost to health services [5]. Patient benefits are associated with fewer ED visits [1] but challenges remain as to how attendance may be reduced [6].

Current literature suggests that with appropriate training a large proportion of seizures that currently result in ED attendance for PWE can be managed safely by patients, their families or carers, in the community [7]. Trials of interventions to improve self-management and

reduce UK ED attendance are ongoing [8]. Epilepsy Nurse Specialists (ENS) delivering self-management education have the potential to reduce attendance [2,8] but robust evaluation around the range of possible interventions remains limited [9]. Data on the predictors of attendance and therefore specifically on who interventions may be focussed for most benefit is also limited. This study focused on the characteristics of ED attendance for PWE in a single UK rural population. Findings are compared briefly to a previous similar study in an urban setting, also in the UK [10].

2. Methods

This study was based at a single hospital with a 24-hour Consultant led ED serving approximately 536,000 residents across a predominantly rural population in Cornwall, UK [11], with a reported epilepsy prevalence of 0.86% [12]. People with epilepsy over 18 years, with at least a year of holding a confirmed diagnosis of epilepsy, and who had attended the ED following a seizure within the 12-month study period were invited to participate shortly after discharge. Attendance at ED was defined as admission to the ED and assessment by an ED doctor. Diagnosis was determined through ED records and epilepsy records held

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by the study hospital's ENS team which consisted of an ENS and a part-time administrator.

Individuals who did not reside in the hospital catchment area (i.e. the county of Cornwall, as identified by their registered permanent residence) were excluded from the study. Individuals who lacked cognitive ability to provide relevant information to complete the questionnaire or were judged inappropriate for home visit due to risk issues identified by the ENS team or had a 'clinically significant comorbidity', were also excluded from the study. 'Clinically significant comorbidity' was defined as other non-seizure health conditions in a PWE which had led to the ED attendance. Decisions cognitive ability, risk issues, and clinically significant co-morbidity' were made by the direct clinical team based on team clinical discussion. The project was conducted by a researcher who had oversight from an implementation committee comprised of an ENS, ED consultant, consultant neurologist, and a consultant neuropsychiatrist. An advisory committee of national experts including senior academics in general practice, neurology, and psychology provided specialist guidance. The two committees provided expert guidance on the minority of cases where there was ambiguity of inclusion/exclusion criteria.

Those who consented undertook a battery of validated, generic, and epilepsy-specific self-reported questionnaires [13–17] looking at the various psycho-social factors influencing the PWE's decision to attend ED. Questionnaires were focussed around predictors of epilepsy, including seizure frequency and recency [18,19], quality of life [20], seizure severity [21], psychological distress [22], stigma [23], psychiatric comorbidity [24], medication adherence [25], knowledge [13], age and ethnicity [26], sex [27], and socioeconomic status [28]. Additional information regarding measures can be found in Table S1 (Supplementary Table). Where required, assistance in completing the questionnaires was provided by the researcher. Social deprivation status was estimated by mapping attendees' postcode onto the index of multiple deprivation [29].

NHS ethical approval was granted by NRES South West Exeter reference: 13/SW/11. Data were collected for a full calendar year between March 2013 and March 2014. The characteristics associated with ED use were identified using zero-truncated negative binomial regression to account for over dispersion and exclusion of zero values in ED use. Initially, unadjusted regression models were fitted to examine the associations between each of the social factors with ED use. Where variables were significant they were entered into a multiple regression using a stepwise selection procedure. Relative ED use is described using incidence-rate ratios (IRRs), with corresponding 95% confidence intervals (CIs). Over dispersion was assessed using the likelihood ratio test and the Wald statistic provided the statistical significance of variables. All p values were two-sided and the significance level alpha was set at 5%. Analyses were performed using the R statistical software.

3. Results

3.1. Recruitment rate and demographics

One hundred fifty-five PWE were initially identified as eligible to approach for the study. Seventy of these were subsequently excluded. Of those excluded, 24 (34%) did not reside in the hospital catchment area, 20 (29%) were unable to complete the questionnaire, 14 (20%) had a significant comorbidity, and 12 (17%) were judged inappropriate for a home visit.

Eighty-five PWE were subsequently approached to participate in the study. Forty-six (54%) were recruited with the remaining 39 (46%) either explicitly or implicitly (i.e. not returning the signed consent form) opting out from inclusion in the study. Reasons for not consenting were not recorded. People with epilepsy previously recruited, excluded or opting out, who attended the ED on additional occasions within the study 12-month recruitment period were not approached a second time. All recruits described themselves as white British. The mean age

for the study population was 43.5 years (median 42.5 years). Twenty-nine (65%) were male (mean age 45.3 years) and 17 (35%) were female (mean age 37.8 years). Median deprivation score (IQR) for the cohort was 22.9.

3.2. Frequency of ED use for PWE

Mean ED use for PWE recruited to the study was 2.4 attendances in the previous 12 months. Just over a third (n = 17, 37%) attended for seizures 3 or more times within this time period. This group of high attendees whose mean was 6.5 attendances accounted for almost two-thirds (n = 71, 65%) of the 111 reported total ED attendances (Fig. 1) by all participants of the study.

3.3. Characteristics associated with ED use for PWE

Number of seizures reported by individuals ED attendance was significantly associated with ED use (IRR 1.16 CI 1.04–1.28). Respondents were asked to report the number of seizures they recalled experiencing in the same 12-month time period prior year to a maximum of 10 or more (recorded as 10). Those reporting 3 or more ED visits reported a mean of 7 seizures in the previous year while those with 2 or less ED visits reported a mean of 5.5 seizures.

Age, gender, and ethnicity were not significantly associated with ED attendance for our study cohort. Those participants aged between 25 and 50 years had a near significant association (IRR 2.62 CI 0.97–7.11). While depression, epilepsy knowledge (relating to social and medical aspects of the condition), medication management, and stigma were not significantly associated with ED use, anxiety was nearly significantly associated (IRR 1.91 CI 0.91–3.99). Social deprivation was marginally significantly associated (IRR 2.35 CI 0.98–5.67) with ED use, with those from more socially deprived areas reporting more frequent attendance for seizures. Table 1 provides specifics of the different factors assessed and their association with frequency of ED use.

4. Discussion and conclusion

People with epilepsy in our study cohort who attended ED on 3 or more occasions for seizures in the 12 months prior to their visit accounted for one-third (37%) of all ED attendees and 65% of total visits. This group also reported more seizures in the 12-month time period prior to admission but not substantially more seizures than the group of less than 3 ED attendees. Emergency department admissions for this group may be reduced if alternate strategies to manage emergencies are in place. Anxiety appeared to be a key factor in the study. Better preventative approaches focussed on reducing anxiety and increasing awareness by Emergency department counselling, guidance, and fostering confidence to self-manage needs to be considered. It is often these issues rather than clinical need that determine attendance at ED for

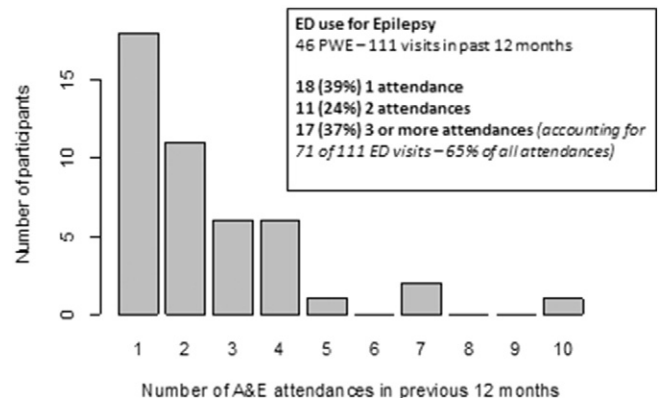


Fig. 1. Emergency department attendances in previous 12 months.

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