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Non-traumatic Dental Presentations at Accident and Emergency Departments in UK: A Systematic Review

IN BRIEF

- Our review shows that there is some evidence on the demographics of patients attending A&E departments in the UK with NTDC (Non-traumatic dental conditions).
- Highlights there is little research on the extent of NTDC attendance at A&E departments in the UK
- Suggests attendance at A&E for NTDC may be more frequent ‘out of hours’, mostly for conditions related to dental pain or infection and by people living in areas of socioeconomic deprivation.

ABSTRACT

Objective: Attendance at accident and emergency departments (A&E) for non-traumatic dental conditions (NTDC) is increasing in high income countries. Not all NTDC visits to A&E are inappropriate, those that are, take up capacity with conditions which are adding to the pressure regarding cost and healthcare utilisation for A&E departments. The scope of this problem is yet to be understood in the UK. The aim of this study was to systematically review the literature to identify peer reviewed research publications reporting non-traumatic dental presentations at A&E departments in the UK.

Data sources: A structured search of Cochrane Library, EMBASE, MEDLINE, CINAHL, PsycINFO, Scopus and Web of Science databases from their earliest date to May 2018. Hand searching of identified articles that met the inclusion criteria was also reviewed.

Data Selection: Publications were included if they were primary research on A&E users in the UK with NTDC as the primary reason for the A&E visit.

Data Extraction: Data was extracted on the study, patient and visit characteristics.

Data Synthesis: Studies were assessed for methodological quality and the analysis took the form of a narrative review.

Conclusion: There is limited evidence, of variable quality, to inform on the extent of inappropriate presentations of patients with non-urgent NTDC to A&E departments in the UK. The evidence supports the hypothesis that dental patients are inappropriately seeking care for NTDC at A&E departments and this may be a driver of unnecessary antibiotic prescriptions. Further research should focus on the reasons for this occurrence.

INTRODUCTION

In 2017, the British Dental Association estimated 135,000 patients inappropriately attended A&E departments with dental conditions such as toothache, costing the National Health Service an estimated £18 million per year [1]. Patients in the United Kingdom (UK) are increasingly seeking help from non-dental health practitioners for acute dental related problems [2]. Management of acute dental conditions often requires definitive treatment with an operative dental procedure. Non-dental health practitioners are challenged to provide these treatments because they are unlikely to have the appropriate equipment or training [3]. A&E departments primarily deliver care for medical emergencies and for patients with significant traumatic conditions. Patients receiving medical treatment for NTDC at A&E may get symptomatic relief but without definitive treatment are at risk of serious complications from odontogenic infection and recurrence of the problem [4]. In addition, inappropriate use of antibiotics could be driven via this route [5].

Dental patients attending A&E add to the pressure on the already over-burdened services in the UK [6] and elsewhere [3,7-9]; however, the extent of this problem is currently unknown in the UK. It is not clear from the research literature the exact volume of patients using A&E departments for NTDC due to coding errors [10] and under reporting by government organisations [6].

A&E usage for conditions meant to be managed in primary care by General Medical Practitioners [11] in the UK (including possible interventions to address these issues) is well reported, however this is not the case for NTDC which should be managed in primary care dentistry. If the UK mirrors other developed countries regarding A&E visits for dental problems, NTDC attendance could be higher than visits for medical conditions such as asthma [12,13], hypertension [14], diabetes [14] and back pain [15]. This is a potential public health problem which could be worsening, especially as there is no system to monitor it. The aim of this systematic review was to summarise studies on NTDC presentation at UK A&E departments. Specifically, we attempted to address the request question: what is the extent of A&E NTDC attendance in the UK?

METHODS

The guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [16] were used. A full study peer reviewed protocol is available: International prospective register of systematic reviews (PROSPERO 2017 CRD42017069037).

Search Strategy

A comprehensive search strategy was developed for each database with the support of an information specialist using a combination of 'dental related' and 'emergency care related' terms (Table S1 available as online supplementary file). The references of all articles that met the inclusion criteria (Table 1) were also hand searched for possible studies.

Table 1 Inclusion and Exclusion Criteria

Study Selection

Search results were downloaded into endnote X7 and de-duplicated by one reviewer (OB). Titles and abstracts were screened by one reviewer (OB) and 10% were checked by a second independent reviewer (JC). Full texts of eligible articles were independently screened by two reviewers (OB/JC). Full papers that did not meet the inclusion criteria (Table 1) were excluded at this stage and reasons recorded (see Figure 1). Any disagreement was resolved through discussion.

Data Extraction and Quality Assessment

Included studies were extracted into pre-piloted standardised form by one reviewer (OB) and verified by a second reviewer (JC). Consistent with our research aim, data was extracted on: (1) study characteristics, (2) patient characteristics and (3) visit characteristics.

Included studies were assessed for methodological quality by two reviewers (OB & JC) independently using the National Heart, Lung and Blood Institute Quality Assessment Tool for Observational Cohort and Cross Sectional Studies [17]. Kappa coefficient of Cohen was used to quantify the inter-rater reliability [18].

Data Analysis

A narrative synthesis is intended due to heterogeneity in the included studies. Any study not reporting on a particular outcome will be excluded in the analysis of that outcome.

RESULTS

Search Outcome

The search strategy identified 13529 records. After screening titles and abstracts, 37 records were retrieved for full text review. Additional information was requested from one author, unfortunately no reply was received. Four studies met the inclusion criteria and were included in this review.

Figure 1 shows the flow of information through the different stages of the review.

Overview of Included Studies

Four papers were identified (Table 2): two English studies [19,20], one Scottish study [21] and one from Northern Ireland [22]. The most recent studies were conducted in England published in 2016 [19] and 2017 [20]. The Scottish and Northern Irish studies were reported over twenty years ago [21,22]. The number of participants ranged from 90 [21] to 2504 [19]. Three studies included data on dental injury or traumatic dental patients [20-22]. Two were retrospective studies [19,20] and used the A&E attendance data, one study used the A&E day book and hospital charts [22] and one included child attendance data [20] for emergency dental services at A&E.

Two studies identified dental presentations based on the reason of the visit [20,22]. Currie et al [19] utilised the International Classification of Disease (ICD-10) code for dental and oral diagnoses.

Table 2 Literature Matrix

The quality of studies (Table S2) were judged as: one good quality study [20], one fair [19] and two poor quality studies [21,22]. The overall interrater reliability on quality assessment was 89% which signifies a strong level of agreement. All identified articles, irrespective of quality were included in this review.

The outcomes reported by each included study are shown on Table 3. Table S3 gives a descriptive summary of them.

Table 3 Outcomes reported by the included studies

Age

Mixed age Studies

Currie et al identified the mean age of male attendees as twenty-nine years (std 19.4) and thirty-two years (std 19.7) for females [19] with over half (53.9%/N) male patients. The highest attendance n=631 (25%) was in the 16-24 age group and over 65 age group (6%/N) [19] had the lowest attendance.

Pennycook et al [21] had an overall mean age for all patients as 24.2 years with a highest attendance n=54 in the 20-29 age group. The lowest attendance (N= 3) was observed in the 50 years and over age group.

Child Studies

Both child studies reported the age of attendees for all dental reasons. The age range was 0-18 years, the majority aged less than four years (p=0.001) [20] and 1 month to 12 years 10 months with 207 (51%) under the age of five [22].

Gender

Three studies reported information on gender [19,20,22]. Both child studies reported the gender of patients who presented for all dental reasons with boys attending more than girls. One mixed age study [19] reported there were slightly more male attendees (N=53.9%) and they were also the majority of repeat attenders (N=56%).

Ethnicity

Marshman et al [20] was the only study which discussed ethnicity and categorised patient's ethnicity as 'other' or 'white'. Patients were divided into two clusters; cluster one, attended for dental injury, while cluster two attended for non- dental injury related problems. In 2003-2004 and 2012-2013, children in cluster two were predominantly from a non-white ethnic group [20].

Socioeconomic Status

The two studies in England reported on measures of socioeconomic status of attenders [19,20]. Majority of patients (N= 40%) came from areas with an IMD (Index of Multiple Deprivation) rank of 1 (most deprived) or 2 [19]. Children in cluster two were more likely from the most deprived areas in Sheffield [20].

Repeat Attendance

Currie et al [19] reported 10% repeat attendance [19]. Of the 175 attendances for toothache, Fleming et al reported five children presented more than once [22]. Pennycook et al reported that for all dental reasons, 107 patients presented on 109 occasions [21].

Dental Diagnosis

Most common diagnosis in each study were: dental unspecified (30), acute pulpitis (31), pericoronitis (31), caries (32), oral mucosal lesion (32) and toothache (33). Toothache and dental abscess was a common presentation across three studies [19,21,22].

Most Frequent Attendance Day

Fleming et al [22] analysed evenings, weekend and public holidays dental attendance. The most frequent attendance was observed out of hours [19,21,22] but one child study recorded a higher attendance on weekdays [20] for all dental reasons.

Prior Visit to the Dentist

Pennycook et al [21] reported 30 out of 90 patients attempted to see a dentist but only eight were successful. No further information was provided on why 22 patients were unsuccessful. The remaining 60 made no attempt to see a dentist prior to attending A&E.

Patient Discharge

In Currie et al [19] all patients were discharged home, whereas Pennycook et al reported 88 out of 90 patients were referred to dental professionals with 50 referred to their own dentist [21]. It wasn't clear however if they were actively referred to their dentist or discharged home with a recommendation to make their own arrangement to see the dentist. Marshman et al reported that over three study years, children who attended for non-dental injury problems were less likely to be referred to another specialty when compared with children who attended for dental injury problems [20].

Management

Out of 90 presentations, antibiotics were prescribed in 33 cases and oral analgesics in 62 cases [21]. Children who attended for non-dental injury problems were more likely to be given medications compared to those attending for dental injury problems in two study years and prescriptions increased almost four fold in the study period [20].

Non-Traumatic Dental Visits

This was defined differently across all four papers. NTDC visit was reported as 2504 out of 2821 attendees who did not require admission [19], 90 (82.6%) who attended for non-traumatic dental problems [21] and 262 who presented with non-traumatic dental injuries [22]. Marshman et al (2017) reported 259 patients attended for non-injury related dental problems in 2003-2004, 307 in 2004-2005 and 351 in 2012-2013 [20].

Cost

Using the NHS national tariff, the average cost of an A&E visit was reported as £54 in one child study [20]. The total cost of all dental visits in 2012-2013 was reported as £37098 in 2012-2013 [20]. One mixed age study noted the average cost of an A&E visit for all reasons as £132 [19] from the department of health A&E attendance reference cost for 2014-2015.

DISCUSSION

This systematic review has revealed a paucity of research on NTDC attendance at A&E in the UK. The evidence found that patients were attending with NTDC and some went on to re-attend for conditions such as toothache. Most frequent attendance was observed in young adults in the mixed age studies and children under five in the child studies. The mixed age studies also reported a low attendance rate in patients over 65 [19] and the 50 plus age group [21]. NTDC presentation as a percentage of all A&E attendances was noted as 0.7% in two studies [19,20]. Patients presented with conditions related to dental pain and infection. Three studies observed patients attended mostly when primary care dentistry was closed [19,21,22]. Two studies reported most patients who attended for NTDC came from socioeconomic deprived areas [19,20] and two studies reported on the symptomatic management with antibiotics and analgesics [20,21].

NHS dentistry has faced reductions in government funding and it has been suggested that this is impacting on patient care [6]. UK primary dental care is not free at the point of delivery for most patients (except in Scotland). England, Wales and Northern Ireland operates a banding system of payment and free dental care is available for certain people. Research from Canada [23] and the USA [24] found patients living in the poorest areas are more likely to attend the A&E for NTDC which is consistent with the present study findings as financial barriers have been identified as a contributory factor for NTDC attendance and linked to why patients do not seek, or delay seeking early preventive dental care [25].

The findings although limited regarding age are consistent with reports which show young adults are more likely to use A&E departments for dental care outside the UK [3,15,24]. The low attendance in older age groups could be related to frailty and associated complex health care

needs which impact on their oral health behaviour as well as the way they access dental care [26].

The majority of children seen in A&E were less than five years old, although children are eligible for free NHS dental care in the UK. This is consistent with findings of the Child Dental Health Survey (2013) which reported 6% of under five years had not seen a dentist by their third birthday and only 30% had their first dentist visit when they were under two [27]. A recent study showed that parents made multiple inappropriate contacts to non-dental professionals regarding their children's oral pain [28]. The reasons behind child attendances at A&E departments or attendances at non-dental health practitioners for dental problems despite free NHS dental care being available needs further exploration.

Ethnicity has received little attention in this literature, from the one study reporting this, people from 'other' ethnic groups had a higher rate of attendance and this could be due to language barriers and lack of trust in the dentist [29] possibly affecting their use of primary dental care services. This is echoed in a study from the USA which reported non-Caucasian children were more likely to visit the A&E for conditions such as pulpitis, gingival and periapical abscess, while children from Caucasian backgrounds were more likely to visit the A&E due to trauma [30].

Research in America found 80% of dental A&E patients were more likely to be given a medication when compared to a non-dental related A&E visit [31]. Dental patients may be aware they are unlikely to get definitive treatment [3] but may expect temporary relief with antibiotics and pain killers [32] and wrongly believe this to be a cure. This has serious oral health implications and could possibly lead to the postponement of seeking proper dental care and could encourage a cycle of re-attendance [33,34] and unnecessary antibiotic prescriptions which drives resistance.

Opening times within primary care dentistry could contribute to dental patients seeking dental care at A&E departments [35-37]. In most parts of the UK, out of hours, urgent dental care is provided via telephone triage services such as NHS 111, which signposts patients to available dentists. The availability of these urgent appointments varies meaning patients could have to wait in pain for days before an appointment is available. International literature has indicated that dental related A&E visits are occurring most often during out of hours [3,14,30,31,34,36] when primary care services are less available.

The percentage of dental attendees who did not require an admission and non-injury related attendances was 0.7% [19,20]. If this is extrapolated across the UK, it is indeed a worrying insight into the huge burden of dental attendances at UK A&E departments due to increase in staff workload, increases in failures to meet waiting time targets, increased cost and burdens on

the already stretched departments [38]. A 10% re-attendance rate was recorded in one mixed-age study meaning about two hundred and fifty patients re-attended over the three year study period [19]. The age-range and socioeconomic status of these cohort of patients is worthy of note.

Slightly more attendees were male and accounted for the majority of repeat attenders [19]. This is consistent with previous reports outside the UK [3,14]. The reason for a possible gender difference in NTDC attendance at A&E is not known and requires further investigation.

In the mixed age studies, patients were discharged on the same day [19] or referred to a dental professional [21]. This could further support the claim that these were inappropriate presentations to the A&E.

Available international literature suggests NTDC A&E visits are mainly due to dental problems related to toothache and infections [8,9]. It is also interesting to note that Currie et al [19] recorded the most frequent reason for presentation as 'dental unspecified' [19]. This unspecific diagnosis has also been reported as the highest dental diagnosis at A&E in international literature [31] and could be linked to the limited dental knowledge of A&E medics.

Half of the hospital sites were located in a deprived area and the other half in a least deprived area. Other area characteristics such as fewer primary care dentist and public transport links should be considered as these may affect the choice of patients with NTDC attending A&E departments rather than to a dentist.

Implications

The public should also be made aware of the inability of the A&E to appropriately manage NTDC. It should also be noted that A&E NTDC visits increase the cost burden for the NHS as they are borne solely by the NHS not the patient or the clinician. Preventative dental care within primary care dentistry is cheaper for the NHS and more effective [10].

Limitations

The lack of published research on this topic in the UK may mean the present study has not identified the true characteristics of NTDC attendance. The paucity of identified studies meant that all research was included regardless of the quality. One study [22] had incomplete data as hospital charts were missing for 12% of eligible patients (N = 49). The time frame for data collection was short for two studies [21,22] and some data reported was for all dental attendances and not just for NTDC [20-22]. Data in three studies were from retrospective data sources which

has its inherent drawbacks [39]. Errors with coding of dental conditions at A&E have been reported [40] leading to inaccuracies in actual numbers. There might also be some form of selection bias due to influencing factors that drive patients to these particular A&E departments meaning the results seen might not be a true representation of the burden of NTDC attendance in the UK as a whole. Having only four papers and heterogeneity in the included studies prevented the combination of the various results thus limiting the ability to perform a quantitative meta-analysis which could affect our conclusions.

There is lack of published research on this topic in the UK. Further research is therefore vital to understand the reasons behind the choice of attending A&E for NTDC rather than primary care dentistry. Despite these limitations, this systematic review identified that patients with NTDC are attending A&E departments in the UK. This should be considered a public health issue and policy makers need to target interventions at patient groups that are more likely to attend the A&E for NTDC.

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