Although epidemiological surveys show that overall normative need does not vary by socioeconomic status (SES)(2), utilisation of orthodontic services in Europe has been shown to vary (2–4). There is concern regarding lower levels of access for children from lower SES groups due to lack of provider availability and/or poor oral hygiene prohibiting treatment of these children.

In addition to variation in the utilisation of courses of NHS orthodontic treatment, the pathways to treatment and treatment refusal, and the levels of treatment termination, may vary by SES:

- Early referrals of children in higher SES groups (due to pressure from parents on the referring dentists (1) and higher levels of attendance for dental check-ups at earlier ages) may result in more ‘assessment & review’ appointments for those in higher SES groups.
- Inappropriate referrals of children in higher SES groups with IOTN scores of less than 3.6 (due to pressure from parents on the referring dentists (1)) may result in more direct ‘assessment & refuse’ appointments (i.e., on initial contact with the orthodontic service) for those in higher SES groups.
- Referrals of children in lower SES groups with IOTN scores of 3.6 and above but poor oral hygiene and/or low motivation to complete treatment (both of which should be addressed prior to referral) may result in more ‘assessment & refuse’ appointments for those in lower SES groups.
- Treatment terminations due to lack of communication between the clinicians and patients and strict policies regarding patients who miss appointments (2) may result in more treatment terminations for those in lower SES groups.

Objectives

This study seeks to determine whether the utilisation of NHS orthodontic services by children in Greater Manchester is needs-driven or whether it reflects SES inequalities. We examined several aspects of utilisation:

- Utilisation of courses of NHS orthodontic treatment
- Utilisation of ‘assessment & review’ and ‘assessment & refuse’ appointments
- Treatment termination

Non-needs driven utilisation of assessments, and treatment terminations, are further investigated in order to estimate the cost to the NHS of inefficient use of orthodontic services that fail to maximise health gains for the population in need of orthodontic services.

Data and methods

The analysis was based on the NHS orthodontic activity records for Greater Manchester between 2008 and 2012. IMD2010 deciles (associated with the patients’ postcode) were used as a proxy for SES. The costs to the NHS were based on a mean cost per unit of Orthodontic Activity (UDA, i.e., weightings of clinical orthodontic work that reflect the complexity of the work) of £56.42, as orthodontic treatment is commissioned on the basis of the provision of UDAs.

In order to determine whether utilisation of courses of orthodontic treatment is related to SES, we examined the percentage of children from Greater Manchester PCTs who underwent NHS orthodontic treatment starts, by IMD2010 decile. In order to investigate whether there are differences in the pathways to treatment and utilisation of ‘assessment & review’ and/or ‘assessment & refuse’ treatment, by SES, we estimated logistic regression models. The models all employed the lowest IMD2010 decile as a reference category and conditioned on normative need (based on IOTN scores).

Table 1: Odds ratios (with p values) from logistic regression models

Results and discussion

As shown in Figure 2, the use of NHS orthodontic treatment tends to be more common for those in the middle SES groups, with children from both low and high SES groups having lower levels of use. This could be associated with lower levels of access and/or higher levels of poor oral hygiene in the low SES groups, as well as treatment options only being available privately (e.g. transparent brackets and invisible lingual appliances that are fitted behind the teeth) and there may be shorter waiting times in the public sector. These findings mirror those of a study in Denmark, which reported that children from the middle SES groups had the most orthodontic treatment (4).

Table 1 shows that ‘assessment & review’ appointments are significantly associated with higher SES, as are ‘assessment & refuse’ appointments. Although this could be associated with pressure from parents on dentists to refer patients earlier and to refer children without significant malocclusion. ‘Assessment & refuse’ appointments for patients with IOTN scores of 3.6 and above are significantly more common in high than lower SES groups, which may relate to the children in lower SES groups being more likely to have poor oral hygiene and/or low motivation to complete treatment.

Table 1 also shows that treatment terminations are significantly associated with lower SES. The Danish study showed that children from lower SES groups had a greater frequency of treatment terminations than the remainder of the children (5). The analysis cannot elucidate the cause behind this trend, but a study in the US reported that variables assessing orthodontic clinicians’ perceptions of the patient-relationship had the strongest association with cooperation of patients in orthodontic treatment (5).

As shown in Table 2, the costs to the NHS of ‘assessment & review’ appointments over 2008 to 2012 in Greater Manchester amounted to £1,556,176, while the costs of direct ‘assessment & refuse’ appointments came to £423,432 and those for children with IOTN scores of 3.6 or above amounted to £1,185. The costs of all treatment terminations amounted to £3,034,324, but the costs of terminations that resulted in no change or worsening of the IOTN score did not contribute (£9,943), while costs between commencing treatment and termination of treatment came to much less, at £380,327 (however, in the majority of cases, IOTN scores were not reported at treatment termination).

Conclusions

The findings show that utilisation of NHS orthodontic services is unevenly distributed across different SES groups, even though the most recent epidemiological survey of malocclusion in the UK has reported that overall normative need does not vary by SES (2). With regard to specific aspects of utilisation, both assessment appointments that are linked with higher SES, and treatment starts, and treatment terminations, show associations with SES. Differences in attendance of ‘assessment & review’ and ‘assessment & refuse’ appointments and treatment terminations, by SES suggest that some of the drivers of the high costs to the NHS in Greater Manchester (between 2008 and 2012) are associated with ‘assessment & review’ appointments (over £1.5 billion), ‘assessment & refuse’ appointments (over £0.5 billion) and treatment terminations (over £3 billion) are linked with patients from lower SES groups. The number of ‘assessment & review’ and/or ‘assessment & refuse’ appointments should reduce the high costs of these assessments and will likely have an impact on higher SES groups. Treatment terminations are a significant waste of NHS resources and policies aimed at reducing these should target lower SES groups.

References