Why are acute admissions to hospital of children under five years of age increasing in the UK?

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Keywords

General Paediatrics, Paediatric Practice, Patient perspective, hospital admissions

Word count (excluding title page, references, figures and tables)

1701

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Children's use of hospital services in the UK has been increasing rapidly since the late 1990s (1-6). Findings from the latest QualityWatch report show significant increases in emergency hospital admissions for infants (23%) and young children aged 1-4 years (11%) between 2006/7 and 2015/16 (data has been adjusted for population increases in each childhood age group), whilst children over the age of 15 years showed a decrease in emergency admissions (6). See Box 1 for their definition of emergency admission.

Box. 1 Definition of an emergency admission

'An admission to hospital that is unpredictable and at short notice because of clinical need. This admission can come via a variety of routes, including the hospital's A&E department, a general practitioner, a consultant clinic or a bed bureau. Our definition excludes transfers of admitted patients from other hospital providers in an emergency.'

(6)

This paper discusses some of the theories and research which provide some insight into the increase in hospital admissions for infants and children under 5 years of age in the UK. Research has been identified in the following areas: social expectations of parents with a sick child, the media and parental anxiety, access to primary care, acuity of the illness, thresholds for admission, duration of hospitalisation and readmission rates, and the impact of health policy, each of which is discussed briefly below.

Social expectations of parents with a sick child

The unwritten rules of society place pressures on parents to conform to social expectations. When their children are acutely ill, parents are expected to contain the management of the illness within the family if the illness is minor and to seek help if the illness is serious (8). Parents learn from experiences, in the early days as parents, that they will be subject to felt or enacted criticism if they seek help at the wrong time, or in the wrong place for the level of severity of the illness (9). This isn't surprising given the promulgation of the concept of 'inappropriate attenders' that underpins the thinking of many professionals in first contact services (10-12). Parents are left to judge the level of illness, often without detailed safety netting advice (13). See Box 2 for a definition of 'safety netting'.

Defining safety netting

'In healthcare, safety netting refers to the provision of information to help patients or carers identify the need to consult a healthcare professional if a health concern arises or changes.'

(7)

When parents seek medical help for their children they are doing so because they feel they can no longer manage the illness independently (14). Consequently, if they are unable to secure the help they need from one part of the service, they will try another. In the absence of adequate safety netting, each encounter is likely to increase parent's anxiety (15). Conversely Maguire et al (16) found that giving safety netting advice reduced the likelihood of re-consultation and therefore, presumably parental anxiety. Anecdotally ED staff report that they are more likely to admit a child when they perceive the child's parent(s) to be very anxious, presenting a possible reason for reduced admission thresholds. This experience is supported by evidence of increased investigations (17) and increased antibiotic prescribing (18) when parents are anxious.

Media induced fear factor?

Parents' media associated fear of meningitis has been identified in several studies (14, 19, 20). The rise of social media and 24/7 internet access to news reports has increased everyone's access to information, not necessarily with the tools with which to assess its veracity. There is a difficult balance to strike between raising awareness and raising anxiety for parents. Consequently, it is important to evaluation interventions which aim to inform the public.

Internet searching is parents' default mode when searching for information about a specific illness, after a consultation, often leading to additional anxiety and/or uncertainty as the information available is inconsistent and parents say they do not know what to trust (21). This finding reveals a lack of adequate safety netting (13), leaving parents needing to seek information elsewhere, from sources less likely to criticise or from people who do not know them such as emergency departments (9). If decisions about admission are based on professional's awareness of parent's anxiety levels, this could be a contributory factor to rising admissions. That said, listening to parent's concerns should be central in any consultation, as they are the expert on their child. NICE (22) recommends taking parent's concerns into account when assessing the severity of the child's illness.

Access to primary care

Many of the papers, reporting the rise in admissions, have focussed on identifying conditions amenable to treatment in primary care (primary-care sensitive) or common infections, implying that these children should have been cared for in primary care (2, 4, 6). Yet where GP practices provide greater accessibility, the numbers of children admitted to hospital for short stays did not change, although their use of ED does decline (23). Accessibility seems to be a bigger issue out of hours. The commonest reason for parents to call NHS 111 was because their GP surgery was closed (24). NHS 111 provides easy access to advice in contrast to the multi-step process faced by parents wanting to see a GP out of hours, although the advice is often to see your GP possibly indicating limitations of the telephone triage process or a risk averse culture. Other parental concerns include the lack of

continuity of carer, which parents' attribute to GP's high workloads, resulting in a lack of knowledge about each other and a consequent lack of trust (20), which can lead to parents seeking a second opinion elsewhere (25). One of our team reports the loss of capacity in general practice for same day follow up consultations which may also contribute to additional help seeking elsewhere. As yet, no published evidence has been identified which explores the impact of this loss of capacity for same day follow up. There is evidence, though, that the loss of continuity in general practice is associated with increased hospital admissions (26-28).

Increasing acuity?

Any discussion concerning increasing demand for health care should consider whether or not the increase is a consequence of increasing severity of illness in the population served. Serious infections are rare in childhood (29) and in-hospital mortality rates are falling, suggesting that fewer very sick children are being admitted to hospital (6) partly as a consequence of improvements in immunisation against cases of meningitis and pneumonia (4).

Emerging evidence on acuity levels is inconclusive. Whilst Koshy et al's (5) review of admissions for acute throat infection, one of the top 10 reasons for emergency admission, concluded that severity of that illness had not increased in line with the increase in admissions, Roland et al's (30) more recent assessment of acuity in a large tertiary children's emergency department found, as a proportion of all children presenting, that it was stable, if not increasing. It is important to recognise that 'acuity' is a poorly defined term and represents the amalgamation of a spectrum of measures (physiological, observational and subjective). This ambiguity may explain why the evidence is inconclusive concerning whether or not increasing acuity explains the increase in hospital admissions.

Lowered thresholds for admission

The 'threshold' of any admission is a multifaceted decision. There is a purely clinical component which ranges from need for critical or intensive care which would be undisputed by a majority of

professionals to softer clinical interventions such as the observation of feeding. Layered on top of this are also parent and carer desires (see social expectations above), bed availability (there is an implicit pressure to discharge borderline cases if beds are not freely available) and professional biases. The latter is complex in itself but relates to education and experience, previous adverse events and communication skills (31). A doctor at the beginning of their paediatric training almost by definition is going to be more risk averse than a consultant of 10 years standing. The logic would then follow that an emergency and urgent care services staffed by a higher proportion of those with child health experience, although not necessarily paediatricians, would be able to better quantify and manage risk. However, even taking into account experience increasing awareness of high profile media cases involving medical error and an increased risk of litigation have likely pushed all professionals to a slightly higher risk averse state.

Duration of hospitalisation and readmission rates

Duration of hospital admissions is shorter than ever before; one consequence of this shorter hospital stay is an increase in readmission rates (6), adding to the number of acute admissions. Such short admissions need to be supported by effective safety netting so that children are discharged in the care of parents who have sufficient information to care for their children independently as they recover from their illness.

Impact of health policy

Some UK policy decisions may have had an unintended impact on children's admission rates. Changes to GP contracts in 2004, allowing them to opt out of out-of-hours care, has been linked to the increase in childhood admissions to hospital (2-4). However, the coincidence in the timing of the GP contract change and increasing admissions does not equate to causality. Cecil, Bottle et al.'s (3) time series analysis concluded that although primary care policy reforms had led to increases in admission for children with chronic conditions that could be managed in primary care (primary-care sensitive conditions), short-stay admissions for infectious illness, they suggested, was more likely to

be related to lowered thresholds for hospital admission and/or the admission of children for observation as a consequence of the 4 hours wait target in UK emergency departments. The continuing trend, despite improvements in childhood mortality and morbidity, suggests that a broader, more holistic, integrated approach to the issues is needed.

In conclusion

This short review has found little evidence that increasing admission is related to increased acuity, instead it has revealed a complex interplay of health policy driven targets, access to primary care out of hours, loss of continuity in general practice, reducing length of stay and increasing readmission rates, limited safety netting, and the impact of social media and social expectations on parents and professionals. Gill et al (4) concluded that the rise in admissions for common infectious illness in children under 5 years represented 'a systematic failure of the NHS in assessing children with acute illness that could be managed in the community', a conclusion also derived from Saxena et al's (2) earlier work. Further research is needed to understand the impact of the whole of the child's journey to hospital admission, so that interventions can be developed to safely care for children with acute illness at home rather than in hospital.

References

1. Sands R, Shanmugavadivel D, Stephenson T, Wood D. Medical problems presenting to paediatric emergency departments: 10 years on. *Emerg Med J.* 2012;29.

2. Saxena S, Bottle A, Gilbert R, Sharland M. Increasing Short-Stay Unplanned Hospital Admissions among Children in England; Time Trends Analysis '97–'06. *PLoS ONE*. 2009;4(10):e7484.

3. Cecil E, Bottle A, Sharland M, Saxena S. Impact of UK Primary Care Policy Reforms on Short-Stay Unplanned Hospital Admissions for Children With Primary Care–Sensitive Conditions. *Ann Fam Med.* 2015;13(3):214-20.

4. Gill PJ, Goldacre MJ, Mant D, Heneghan C, Thomson A, Seagroatt V, et al. Increase in emergency admissions to hospital for children aged under 15 in England, 1999-2010: national database analysis. *Arch of Dis Child*. 2013;On line first(February 11, 2013).

5. Koshy E, Murray J, Bottle A, Aylin P, Sharland M, Majeed A, et al. Significantly increasing hospital admissions for acute throat infections among children in England: is this related to tonsillectomy rates? *Arch of Dis Child.* 2012;97(12):1064-8.

6. Keeble E, Kossarova L. Quality Watch. Focus on: Emergency hospital care for children and young people What has changed in the past 10 years? Research report. The Health Foundation and Nuffield Trust; 2017.

7. Roland D, Jones C, Neill S, Thompson M, Lakhanpaul M. Safety netting in healthcare settings: what it means, and for whom? *Arch Dis Child Educ Pract Ed* 2014;99(2):48-53.

8. Neill S. Containing acute childhood illness within family life: A substantive grounded theory. *J Child Health Care.* 2010;14(4):327-44.

9. Neill S, Cowley S, Williams C. The role of felt or enacted criticism in understanding parent's help seeking in acute childhood illness at home: A grounded theory study. *Int J Nurs Stud.* 2013;50(6):757–67.

10. Ehrich K. Reconceptualizing 'inappropriateness': researching multiple moral positions in demand for primary healthcare. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine.* 2003;7(1):109-26.

11. Sanders J. A review of health professional attitudes and patient perceptions on 'inappropriate' accident and emergency attendances. The implications for current minor injury service provision in England and Wales. *J Adv Nurs.* 2000;31(5):1097-105.

12. Sempere-Selva T, Peiro S, Sendra-Pina P, Martinez-Espin C, Lopez-Aguilera I. Inappropriate use of an accident and emergency department: magnitude, associated factors, and reasons-an approach with explicit criteria. Ann Emerg Med. 2001;37:568 - 79.

13. Jones C, Neill S, Lakhanpaul M, Roland D, Singlehurst-Mooney H, Thompson M. The safety netting behaviour of first contact clinicians: a qualitative study. BMC Family Practice. 2013;14(1):140.

14. Neill S. Family Management of Acute Childhood Illness at Home: A Grounded Theory Study [Doctoral]. London: King's College London; 2008.

15. Royal College of Paediatrics and Child Health, Royal College of General Practitioners, College of Emergency Medicine, NHS Direct, University of Leicester, University of Nottingham, et al. To understand and improve the experience of parents and carers who need assessment when a child has a fever (high temperature). London: Royal College of Paediatrics and Child Health; 2010.

16. Maguire S, Ranmal R, Komulainen S, Pearse S, Maconochie I, Lakhanpaul M, et al. Which urgent care services do febrile children use and why? *Arch Dis Child.* 2011(online June 3).

17. Natale JE, Joseph JG, Rogers AJ, et al. Cranial computed tomography use among children with minor blunt head trauma: Association with race/ethnicity. *Arch Pediatr Adolesc Med.* 2012;166(8):732-7.

18. Lucas PJ, Cabral C, Hay AD, Horwood J. A systematic review of parent and clinician views and perceptions that influence prescribing decisions in relation to acute childhood infections in primary care. *Scand J Prim Health Care*. 2015;33(1):11-20.

19. Kai J. What worries parents when their pre-school children are acutely ill, and why: a qualitative study. *BMJ*. 1996;313(7063):983-6.

20. Neill S, Jones C, Lakhanpaul M, Roland D, Thompson M. Parents' help-seeking behaviours during acute childhood illness at home: A contribution to explanatory theory. *J Child Health Care.* 2014;Online first October 8, 2014.

21. Neill S, Jones C, Lakhanpaul M, Roland D, Thompson M, the ASK SNIFF research team. Parent's information seeking in acute childhood illness: what helps and what hinders decision making? *Health Expect.* 2014:Online first October 20, 2014.

22. National Institute for Health and Clinical Excellence. Feverish illness in children: assessment and initial management in children younger than 5 years. NICE Clinical Guideline. London: National Institute for Health and Clinical Excellence; 2013.

23. Cecil E, Bottle A, Cowling TE, Majeed A, Wolfe I, Saxena S. Primary Care Access, Emergency Department Visits, and Unplanned Short Hospitalizations in the UK. *Pediatrics.* 2016;137(2).

24. Burger SA, Tallett A, Maconochie I, Pall K. ISQUA16-2682 Children's care pathway and parental experiences following use of NHS 111, a non-emergency medical helpline in England. *Int J Qual Health Care.* 2016;28(suppl_1):31-.

25. Spencer M, Neill S. Choose Well Insight project. Northampton: University of Northampton and Nene Clinical Commissioning Group; 2013.

26. Huntley A, Lasserson D, Wye L, Morris R, Checkland K, England H, et al. Which features of primary care affect unscheduled secondary care use? A systematic review. *BMJ Open*. 2014;4(5).

27. Bankart MJG, Baker R, Rashid A, Habiba M, Banerjee J, Hsu R, et al. Characteristics of general practices associated with emergency admission rates to hospital: a cross-sectional study. *Emerg Med J.* 2011;28(7):558-63.

28. Baker M, Jeffers H. Continuity of care in modern day general practice. Royal College of General Practitioners; 2016.

29. Van den Bruel A, Bartholomeeusen S, Aertgeerts B, Truyers C, Buntinx F. Serious infections in children: an incidence study in family practice. *BMC Fam Pract.* 2006;7(1):23.

30. Roland D, Jones S, Coats T, Davies F. Are Increasing Volumes of Children and Young People Presenting to Emergency Departments Due to Increasing Severity of Illness? *Acad Emerg Med.* 2017;24(4):503-4.

31. Roland D. Have we forgotten to teach how to think? *Emerg Med J.* 2017;34(2):68-9.