



## Adolescents with altitude: young people do well on Kilimanjaro

S H M Stokes, N S Kalsou, H Frost, et al.

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## LETTERS

## Do we neglect infant safety during air travel?

Recently, the safety of infant air travel was reviewed concentrating on the dangers of hypoxia.<sup>1</sup> However, there is a deficiency in global air travel safety provision for children especially in the under 2-year-old age group. The Federal Aviation Authority (FAA) and American Academy of Paediatrics (AAP) encourage and insist, respectively, on use of an approved child restraint system (CRS) during air travel for children under the age of 2 years.<sup>2</sup> Optimal infant air travel safety requires a CRS to protect infants in cases of non-fatal or survivable airplane incidents including turbulence, evasive manoeuvres and crashes. Analysis of aircraft crashes from 1976 through 1979 in which there were fatalities and survivors revealed that unrestrained infant passengers had a relative worldwide mortality risk of 9.6 compared with restrained adult passengers.<sup>3</sup>

Increased demand on international routes worldwide caused a 6.4% increase in total global air traffic in 2007. The operational rules of the FAA (and other aviation authorities such as Transport Canada or CASA Australia) do not mandate the use of CRS. There are concerns that making CRS use mandatory would raise air travel costs, resulting in a net increase in fatalities and injuries if families opted for automobile travel due to the higher risk per kilometre of travel in the USA.<sup>4</sup> It is estimated that CRS use would decrease infant air travel deaths by 0.4 per annum in the USA and would cost about £4.4 million (\$6.5 million) per death prevented.<sup>4</sup> However, many parents may prefer their child to have safety precautions similar to those of other adult passengers during air travel.

The travelling public widely accepts either the "supplementary loop belt" or unrestrained infant lap-holding as the most economically attractive, practical and least logistically demanding means to protect their children. However, the supplemental loop belt or lap-holding options do not provide infants with a level of protection comparable to an approved CRS and are associated with fatal abdominal and head injuries in survivable crashes.<sup>5</sup>

We reviewed commercial airline websites to assess their current infant safety practices. The three groups analysed were: "Ten transatlantic low fare carriers" (<http://www.attitudetravel.com/lowcostairlines/>

transatlantic/), "Top ten international airlines 2008" ([www.airtravel.about.com/od/airlines/tp/skytraxbestten.htm](http://www.airtravel.about.com/od/airlines/tp/skytraxbestten.htm)) and "Top 10 US domestic September 2007–August 2008" ([www.airtravel.about.com/od/basedinnorthamerica/tp/top10na.htm](http://www.airtravel.about.com/od/basedinnorthamerica/tp/top10na.htm)). No airline had a policy of mandatory CRS use. The majority of US carriers encouraged use of CRS compared with a minority of the "Top 10 international" carriers. A single airline offered free carriage with use of CRS. No airline supplied CRS. Thirteen airlines had no information on CRS available on their website (table 1).

Some airlines support the use of CRS by offering cheaper flight tickets to children occupying a seat provided parents or guardians supply an approved CRS in which the child will travel. US based airline carriers lead the way with provision of information but have the least financial incentives. In addition, age-appropriate oxygen masks and flotation devices are not available on board aircraft. Parents who plan to use a CRS face a paucity of information and little subsidised travel. We suggest that airlines provide: (1) standardised information on CRS use during air travel, (2) financial incentives (discount fares) when using a CRS and (3) an approved age-appropriate airline-suitable CRS at the departure point.

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## A regional database for autism spectrum disorders

The study of McConachie and colleagues<sup>1</sup> describes some of the challenges of developing a regional database for autism spectrum disorders (ASD) and I raise a further issue. Most children with ASD are diagnosed because of early developmental concerns noted by paediatricians or child psychiatry departments. However, a significant group with early brain damage/dysfunction present with epilepsy, cerebral palsy or a recognisable syndrome such as Down's syndrome. These children have high rates of ASD which are often overlooked.

The stated aims of the database of service planning, epidemiological research to study change over time, family and community involvement, and as a sampling frame for a range of research studies need to be seen in context. Research aims may be achieved providing the autism definition is clear. However, for planning of services the omission of symptomatic ASD means that a significant group of children with multiple disability including autism may be overlooked both diagnostically and in service provision. For those of us managing children with active epilepsy, the problems of involving Children and Adolescent Mental Health Services (CAMHS) in providing comprehensive care for epilepsy, cognitive impairment and behaviours that span autism spectrum disorders, attention deficit hyperactivity disorder, confrontational behaviour and depression are huge and one of the major problems of current epilepsy and disability care.

Databases for ASD aimed at service provision should have a two-pronged approach to include the early onset brain disorders in which cognitive impairment and ASD are common. There also needs to be a model of comprehensive care for this group of children as otherwise there is no point in identifying them.

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## Adolescents with altitude: young people do well on Kilimanjaro

Thousands of young people travel to high altitude annually. Medical problems encountered range from relatively benign acute mountain sickness (AMS) to potentially fatal high altitude cerebral and pulmonary oedema.<sup>1</sup> There is limited information on the incidence of these illnesses, or the varying presentations and outcome of children who succumb to them.

**Table 1** Comparison of airlines and CRS use

Groups	Mandatory CRS		Encourage CRS		Discount without CRS		Discount with CRS		CRS supplied by airline		Website CRS information	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Transatlantic	0	10	5	5	10	0	7	3	0	10	4	6
International	0	10	2	8	10	0	10	0	0	10	5	5
Domestic	0	10	8	2	9	1	4	5	0	10	8	2

CRS, child restraint system.

We studied physiology and AMS incidence in tourist trekkers attempting the summit (Uhuru Peak) of Mount Kilimanjaro (5895 m). All subjects gave written informed consent and ethics approval was obtained from the Tanzanian Commission for Science and Technology. Physiological measurements and the Lake Louise Score (LLS) for AMS were taken on ascent over 4, 5 or 6 days.

We compared 295 adults (177 males, age range 18–70 years, mean 35 (SD 11.6) years) with 16 children (nine males, age range 11–17 years, mean 15 (SD 1.8) years). One child had asthma, controlled with regular beta agonists, and five children had insulin dependent diabetes mellitus.<sup>2</sup>

We found no significant difference in the incidence of AMS (defined as LLS >3, validated in adolescents<sup>3</sup>) between young people and adults on any day, supporting previous studies.<sup>4</sup> The proportion of subjects reaching the summit was similar between the two groups, with 110/181 adults and 6/12 children summiting ( $p = 0.460$ ). Two of five children with diabetes and the child with asthma reached the summit.

Although physiology results did suggest some differences between adults and children (eg, oxygen saturations at 2700 m were 94.1% vs 95.7%,  $p = 0.02$ , Mann–Whitney test), similarities in heart rate and respiratory rate suggest that adults and children have a similar response to high altitude. However, the usefulness of these data is limited by the variation in normal range with age and under-powering of the study (table 1). Given observed differences, we had 17% power to detect differences in the presence of AMS at 4700 m (0.05 significance level).

This research, the largest comparative study of children and adults at altitude, suggests older children are not at higher risk of altitude related disease than adults, and can cautiously enjoy high altitude adventure. However, there is a caveat: rapid rate of ascent is a risk factor for AMS<sup>4</sup> possibly putting younger children at higher risk if they undergo extreme exertion in order to keep up with their adult companions. We recommend vigilance for symptoms and prompt action on diagnosis, which may be assumed if a child becomes unwell at above 2500 m. Adequate travel insurance, familiarity with consensus guidelines on the management of altitude related illnesses in children<sup>4</sup> and a comprehensive medical kit are strongly advised.

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## BOOK REVIEW

### Evidence-based paediatric and adolescent diabetes

Edited by Jeremy Allgrove, Peter Swift, Stephen Greene. Published by BMJ Publishing Group, London, 2007, pp 256, £52.99 (hardback). ISBN 978-1405152921



Do you know the effectiveness of behavioural interventions for adolescents with type 1 diabetes? Do you want to be quickly directed to studies evaluating the safety of mixing rapid-acting insulin analogues with glargine in the same syringe? How often should we take blood from children with type 1 diabetes to screen for coeliac disease? Even if the answer is “nobody knows”, it is important to know that we do not know.

This book undertakes the ambitious task of summarising the evidence (or highlighting the lack of it) on topics relevant to paediatric and adolescent diabetes. That alone makes it a unique book within its field. The editors

are prominent UK physicians, while the authorship is truly international.

The approach that is summarised in the title – seeing the subject of paediatric diabetes through the eyes of an evidence based approach – is noticeable throughout the book. The content is very comprehensive. The book starts with a chapter on the methodology of evidence-based medicine, rightly so as the rest of the book is rooted in this approach. The chapters that follow deal in turn with type 1 diabetes and various specific issues of its management including type 1 diabetes in a very young child, dietary management, patient education and psychological interventions, type 2 diabetes and rare forms of diabetes. I would have expected more space given to the management of type 1 diabetes. On the other hand, the chapter “Rare forms of diabetes” is quite detailed and I found it very helpful when recently seeing a patient with MODY (maturity onset diabetes of the young).

Each chapter is followed by extensive references which, when referred to in the text, are also graded according to the system of the American Diabetes Association. The grading relates directly to the cited study with A referring to the best quality studies and E to expert consensus or clinical experience. This is obviously a very useful feature, although some may find it distracting to be faced with this classification next to each reference.

The chapters that I read first were those on screening for associated conditions and prevention of complications. I am aware that clinicians’ views about what to screen for and how often to screen vary widely and I was looking forward to answers for my questions in this confusing area. Not surprisingly, I have learned that the answer is usually controversial and there is no clear consensus. The value of the book is in the identification and discussion of controversies, highlighting areas where knowledge is lacking, summarising the available evidence and stating what, on the basis of the current state of knowledge, are the accepted guidelines.

*Evidence-based paediatric and adolescent diabetes* is a valuable source of objective information for all who are involved in the management of childhood diabetes.

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**Table 1** Physiology data for adults and children at 2700 m and 4700 m on ascent of Mt Kilimanjaro

		Children				Adults				p Value
		Min	Max	Mean	SD	Min	Max	Mean	SD	
Arterial oxygen saturation	2700 m	94	97	95.7	1.0	83	99	94.1	6.1	0.02
	4700 m	77	91	84.9	4.7	53	98	81.4	7.4	0.09
Heart rate	2700 m	71	111	90.5	14.5	51	130	84.8	13.8	0.14
	4700 m	77	121	97.9	14.7	48	140	98.0	42.2	0.64
Respiratory rate	2700 m	14	24	18.8	3.0	9	27	17.8	7.1	0.08
	4700 m	14	28	19.5	3.8	6	28	17.9	3.5	0.16
Mean arterial pressure	2700 m	71.2	95.3	79.5	21.7	55	137	92.4	26.6	0.01
	4700 m	80	95	88.4	5.1	77	128	100.2	9.8	0.02