Use of cyclosporin A as a steroid sparing agent in cystic fibrosis

EDITOR—In cystic fibrosis (CF) chronic respiratory infection is countered by an intense inflammatory reaction. Systemic steroids have been shown to improve lung function and reduce morbidity in patients with CF and reduce markers of chronic inflammation;1 however, there are significant side effects associated with their long term use. Low dose cyclosporin (Cya) has been shown to be effective in the treatment of inflammatory and autoimmune diseases, corticosteroid dependent chronic severe asthma in adults, and refractory childhood asthma.2

We report six paediatric CF patients where Cya had been used as a steroid sparing agent. These patients were on treatment with high dose inhaled or nebulised steroids prior to the commencement of oral steroids, and repeated attempts at reducing the steroid dose were unsuccessful. All patients exhibited steroid related complications including Cushingoïd features, growth suppression, impaired glucose tolerance, hypertension, osteoporosis, and bone fractures. The dosage of Cya was adjusted to maintain whole blood trough levels between 100 and 150 mg/ml using Cya doses ranging from 2 to 37 mg/kg/day.

In the four patients who benefited from Cya therapy the mean steroid dose decreased from 0.86 mg/kg/day in the one month prior to commencement of Cya to 0.30 mg/kg/day six months later and 0.25 mg/kg/day 12 months later. These patients were able to discontinue oral steroids within 18 months of commencement of Cya. Two patients did not show a reduction in mean steroid dosage, one of which underwent a successful heart-lung transplantation.

In the four patients who responded to Cya, lung function was maintained or improved, as were Chripisin–Norman chest x ray scores. Height velocity was also improved. Three patients developed transient renal impairment, of whom only one required discontinuation of Cya. This was dose related and reversible but is infrequent with lower dose regimens used for anti-inflammatory therapy.3 Other side effects due to Cya were minimal, including mild hypertrichosis and gingival hyperplasia. There was no evidence of hypertension, hepatotoxicity, or neurotoxicity. The side effect profile of Cya is no more severe than for other immunosuppressive agents.

It is evident that Cya is a powerful but potentially toxic therapeutic agent and its use should be balanced against the risks of the disease and the long term use of steroids. These results suggest that Cya can be beneficial as a steroid sparing agent in CF patients; these data may be of help to the clinician in comparable clinical circumstances.

G K BHAL
S A MAGUIRE
M BOWLER

1 Auerbach HS, Williams M, Kirkpatrick JA, Colten HR. Alternate-day prednisone reduces morbidity and improves pulmonary function in cystic fibrosis. Lancet 1982; ii:686-8.

Survey of criteria used to diagnose allergic bronchopulmonary aspergillosis in cystic fibrosis

EDITOR—Allergic bronchopulmonary aspergillosis (ABPA) creates a difficult diagnostic and management problem in patients with cystic fibrosis (CF). The six major diagnostic criteria for ABPA in CF were adapted from asthma guidelines.1 Retrospective studies report significant variability in prevalence and the numbers of criteria for diagnosis.2 This is important as CF databases (UK CF database, European Registry, and the North American CF database) report ABPA frequency either without ascertaining the criteria used, or using limited diagnostic criteria. We have assessed consensus current practice of criteria used by UK clinicians to support a diagnosis of ABPA and how cases were treated.

This retrospective, descriptive postal questionnaire survey was addressed to senior consultants in the 58 CF specialist clinics identified by the UK CF Trust.

A total of 45 replies were received (78%); three were illegible/incomplete. Results are based on 42 replies (72%) from 14 adult clinics (33%), 23 paediatric (55%) clinics, and five (12%) mixed adult/paediatric clinics. Units had a median of 100 patients (interquartile range (IQR) 63 to 160).

Of six ABPA major criteria investigations (table 1), centres routinely tested (at least yearly) a median of four (mode five).

Clinicians were also asked how many of eight factors (table 1) associated with ABPA diagnosis must be present, preferred to be present, or were not considered important. It was considered that a median of two factors (IQR 1 to 4) must be present, three preferred to be present (IQR 2 to 5), and one factor was not considered important (IQR 1 to 2.3). Forty per cent of centres considered one or more further factors in addition to those provided.

Thirty eight per cent of centres would begin treatment without clinical deterioration (62% treat on deterioration). Initial treatment in all centres (100%) was prednisolone: in paediatric patients 1 mg/kg in 21% and 2 mg/kg in 76%; in adults 30 mg/day in 50% (range 20–60 mg/day). In response to failure of steroid treatment 33% would add an antifungal agent, 17% would increase steroid dose (17% no experience against steroid failure, 12% other, 21% no reply). Oral antifungals had been used by 60% of respondents, itraconazole in all cases. Paediatric centres were much more likely to use oral antifungals (88% vs 31%, p = 0.004, Mann–Whitney U test). Nebulised antifungals were used by 21%, amphotericin in all cases.

We also asked how many patients would currently be diagnosed as having ABPA in that unit using: (a) criteria stated as “must be present” earlier in the questionnaire; and (b) if major criteria were strictly adhered to. Clinicians considered that they had a median of 5% of patients with ABPA (IQR 1 to 8), using their own criteria, falling to a median of 0% (IQR 0 to 3) when all major criteria were strictly adhered to.

This questionnaire shows considerable variability in the criteria used to diagnose ABPA in CF. Prospective reporting of cases with defined criteria will be the only way to reliably identify the true prevalence of ABPA. Database surveys may overestimate the true prevalence.

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Subnormal growth in children with Helicobacter pylori infection

EDITOR—We read with interest the study by Choe and colleagues1 in which they investigated the effect of Helicobacter pylori infection and iron deficiency anaemia on growth, especially in pubescent children. In this study, height values were found to be below the 25th centile in 18 of 63 (28.6%) H pylori positive children. The prevalence rate of H pylori infection was 15.3% in children without iron deficiency anaemia and 31.3% in those with iron deficiency anaemia (p = 0.022). They also revealed that the mean height of subjects who had both H pylori infection and iron deficiency anaemia decreased significantly. They concluded that H pylori infection accompanied by iron deficiency anaemia, 1 Rosenberg M, Patterson R, Mintzer R, et al. Clinical and immunological criteria for the diagnosis of allergic bronchopulmonary aspergillosis. Ann Intern Med 1977;86:405-14.

Table 1 Replies to questionnaire (% of all units)

<table>
<thead>
<tr>
<th></th>
<th>Assessed yearly or more</th>
<th>Must be present</th>
<th>Prefer to be present</th>
<th>Not important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspergillus precipitins</td>
<td>83</td>
<td>42</td>
<td>49</td>
<td>10</td>
</tr>
<tr>
<td>Aspergillus specific IgE</td>
<td>52</td>
<td>54</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>CXR infiltrates</td>
<td>95</td>
<td>38</td>
<td>48</td>
<td>17</td>
</tr>
<tr>
<td>Blood eosinophils (&gt;500/mm³)</td>
<td>83</td>
<td>24</td>
<td>56</td>
<td>20</td>
</tr>
<tr>
<td>Aspergillus fumigatus skin test</td>
<td>5</td>
<td>11</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Total serum IgE (&gt;1000 ng/ml)</td>
<td>79</td>
<td>45</td>
<td>45</td>
<td>10</td>
</tr>
<tr>
<td>Bronchiectasis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheeze/cough</td>
<td>—</td>
<td>46</td>
<td>39</td>
<td>15</td>
</tr>
</tbody>
</table>

*Six major criteria investigations.
rather than H pylori infection alone, might delay pubertal growth.

We investigated the frequency of diminished growth in 30 H pylori positive children (21 girls and 9 boys) diagnosed by serology and histology. The mean age was 11.5 (2.0) years (range 8–15). We found 11 (36.7%) H pylori positive patients with height values below the 25th centile. Anaemia was determined in none of the patients. Mean haemoglobin concentration was 130 (9) g/l. H pylori infection is a chronic persistent infection, leading to diminished growth. Chronic gastric inflammation, dyspepsia, decreased nutritional intake, and malnutrition could a decreased nutritional intake, and malnutrition be a contributing factor to growth retardation. We suggest that the development of a simple record may overcome this difficulty. A straightforward record used in a number of nurseries throughout the United Kingdom and the United States has treated over 650 patients with the clinical diagnosis of H pylori infection alone, might delay pubertal growth.

Detection of outbreaks of E. coli O157 infection in nurseries

Editor,—In their report of a serious outbreak of E. coli O157 in a nursery in North Wales, Al-Jader and colleagues recommend that more than one child with more than one bowel motion in a nursery should trigger action including “informing and seeking the advice of public health agencies” 1 and data on healthy children. In the paper we have calculated the additional work that should be done, and we ask if the recommended family participation is really necessary.

We calculated from the data of the society that the 385 day nurseries—385)—that is, 230 per week.

Children who attend out of home care are at increased risk for infectious diseases of which gastrointestinal tract infection is among the most common.

Garner and colleagues recently presented a much needed review of growth monitoring. 2 They have calculated the additional work that would be generated for the Public Health Department in the district where the outbreak occurred if this policy was implemented.

19 of well children on the ground floor of the nursery, six had more than one bowel motion on at least one of the half day sessions attended during the surveillance period. 2 Well children attending for 54 sessions during the period, giving an approximate total number of sessions attended of 228 (19/6×2). The probability of a well child having more than one bowel motion during any half day session was therefore about 0.026 (6/228). There are 385 day nurseries and playgroups in North Wales, with an average of 23 children per nursery. 3 In an average nursery the probability that two or more well children would have more than one bowel motion in a session on any one day is 0.12, equivalent to a false alarm every eight days.

Therefore, if the suggested policy was implemented, and incidents were reported to the Public Health Department, this would result in approximately 46 inappropriate calls per day (0.12×385)—that is, 230 per week. Even if the normal background rate was ten times lower than that seen among well children during this outbreak, this would still result in just over three calls a week to the department reporting false alarms. The proposed “early warning system” is therefore almost unworkable, and the claim that it could have prevented 10–12 of the 31 cases in the outbreak needs to be reviewed.

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Meningococcal disease due to W135: fresh public health concerns

Editor,—The paediatric intensive care unit at St Mary’s Hospital in London admits more than 100 cases of meningococcal disease each year from over 50 different hospitals in the south east of England. Since 1992, the unit has treated over 650 patients with the disease, but had not treated a single case of serogroup W135 meningococcal infection until April 2000. We would like to report four children treated at our unit for meningococcal disease due to serogroup W135, type 2A, subtype P1.2, P1.5, within a one month period from April 2000. They had been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with meningococcal serogroup C conjugate vaccine, and had all been vaccinated recently with 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in contact with travellers returning from Mecca. The clinical features of these cases are outlined in table 1.

The cases represent four out of 38 cases (with five fatalities) of serogroup W135 Neisseria meningitidis infection in England and Wales within the six week period from March to May 2000 (PHLS Meningococcal Reference Unit, personal communication), with hundreds of cases of the identical subtype reported from Mecca to the UK and other countries. This large outbreak of an unusual strain originated in Saudi Arabia, with the pilgrimage of a record 1.3 million people to the Haj between 15–18 March 2000.

A similar outbreak occurred in 1987, due to serogroup A, subgroup III. This also followed the yearly pilgrimage to Mecca, and spread throughout Europe, USA, and Africa over the next two years. Requirements for pilgrims entering Saudi Arabia now include documented vaccination with meningococcal A and C polysaccharide preparation. This public health measure has been effective in irradiating serogroup A disease in these travellers.4 A quadrivalent vaccine is available for serogroup W135 as well as serogroups A, C, and Y. This vaccine, however, is not licenced in the UK, and is only available on a named patient basis. This raises public health issues, including whether people returning from Mecca to the UK should be screened or given prophylaxis.

Even with the anticipated beneficial effects of the meningococcal C vaccination programme in England and Wales, it is important to remember that other serogroups of meningococci will continue to cause significant disease in the UK.

Until 1950, England was predominantly affected by epidemics of serogroup A meningococcal disease. The switch to serogroup B and C disease occurred after the second world war, and serogroup A disease is now rarely seen in the UK. Neisseria meningitidis has the potential to alter its capsular polysaccharide antigen through recombinational exchanges at the capsular locus. In his commentary in the Lancet in 1999, Martin Maiden expressed concern that new hyper-virulent strains of serogroups including B, W135, and Y may emerge as serogroup C disease is eliminated.5 This recent outbreak of serogroup W135 infection does not seem to represent such selection pressure. However, it highlights the need for continued clinical, laboratory, and epidemiological vigilance for meningococcal infection, particularly now that there may be a theoretical risk of other serogroups becoming more prevalent as meningococcal serogroup C disease is controlled.

*Total resuscitation fluid required in first 24 hours

<table>
<thead>
<tr>
<th>Case</th>
<th>Contact with travellers</th>
<th>Presentation</th>
<th>Mechanical ventilation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 10m/F</td>
<td>Grandmother</td>
<td>Petechiae, septicaemia</td>
<td>80 ml/kg fluid</td>
<td>Discharged</td>
</tr>
<tr>
<td>2 27m/M</td>
<td>Father</td>
<td>Purpura fulminans, septicaemia</td>
<td>350 ml/kg fluid</td>
<td>Peripheral gangrene</td>
</tr>
<tr>
<td>3 4m/F</td>
<td>6 family members</td>
<td>Meningitis, seizures, no rash</td>
<td>0</td>
<td>Discharged</td>
</tr>
<tr>
<td>4 19m/F</td>
<td>2 Aunts</td>
<td>Purpura, septicaemia</td>
<td>90 ml/kg fluid</td>
<td>Discharged</td>
</tr>
</tbody>
</table>

**Table 1 Clinical presentation, severity and outcome**

**Prevention and treatment of cow’s milk allergy**

Editor,—Divergences in existing guidelines on the prevention and treatment of cow’s milk allergy (CMA) in infants seem to have settled when a joint statement by the committees of ESPACI/ESPGHAN appeared in *ADC*.6 However, we take exception to some of the assumptions, which have been left open to challenge from both nutritional and allergological points of view. Our concern is that lactose free diets from birth may cause neurological problems in healthy children. Galactose is a functionally important component of myelin galactolipids, but it is unclear whether a lactose free diet plays a role in the clinical neurological abnormalities of children with galactosaemia. However, lactose is essential for patients with UDP-galactose-4-epimerase deficiency.7 Though rare, this disorder should be considered in the evaluation of the risk:benefit ratio and the costs of planning a prevention strategy for which the benefits are still unclear. In this context, issues of colonic ecology and malabsorption take second place.2 The use of screening tests for errors of lactose metabolism as interpreted in the statement may also be misleading. The claim that “feeding lactose-free diets from birth . . . will cause false negative results in most neonatal screening tests for galactosaemia” overlooks the fact that these tests do not establish blood galactose levels but the presence/deficiency of the enzymes responsible for galactosaemia.8 The assertion that “…formulas based on intact soy protein isolates are not recommended for the initial treatment of food allergy in infants, although a proportion of infants with cow’s milk protein allergy tolerate soy formula” is based on the ESPGAN Committee on nutrition9 and on the AAP recommendations.2 While the former concerns itself with clinical gastrointestinal manifestations, the latter recommendations state in conclusion (point 8): “Most infants with documented IgE-mediated allergy to cow milk protein will do well on isolated soy protein-based formula”.6 Initial treatment for allergic disease is avoidance of the incriminated allergen. Soy formula has been recommended in treatment of CMA on grounds of efficacy, adequate nutrient intake, and cost.9 In the absence of prospective studies comparing the allergenicity of cow’s milk hydrolysates against soy formulas in children with CMA, the rationale to alter this indication appears to be lacking.

suppression pattern. There was biochemical evidence of multi-organ damage. He was extubated on day 5 and discharged on day 16 on phenobarbitone. He continued to have frequent myoclonic seizures. At 6 months, phenobarbitone was replaced by sodium valproate with some initial benefit. By 7 months, he was having focal motor seizures affecting his right arm up to 40 times a day and additional atypical absences and tonic seizures. He also showed signs of an emerging spastic quadraparesis. EEG showed right sided spike and wave discharge with a frontal emphasis. At 8 months a trial of oral pyridoxine (30 mg/kg/day) was given. No seizures have been recorded since this treatment was started. He is now 16 months old. He is maintained on pyridoxine 15 mg/kg/day; valproate has been discontinued. The EEG no longer shows spike and wave activity. The signs of spastic quadraparesis remain.

We have reviewed the notes of children attending The David Lewis Centre, a residential school for children with severe epilepsy. Children at The David Lewis Centre are referred from all over the UK and their early epilepsy management has been undertaken at many different centres. 31 children with intractable cryptogenic epilepsies, which started before they were 3 years old, were identified (dates of birth: 1987–1992). Only one of these children was recorded as having received a trial of pyridoxine early in the evolution of their epilepsies. The true prevalence of pyridoxine responsive epilepsy is difficult to assess if the recommendations of Baxter are seldom applied. Giving pyridoxine can be diagnostic and therapeutic—not giving a trial of pyridoxine is common and can have a treatable cause of difficult epilepsy unreconciled and inadequately treated.

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Are sleep studies worth doing?

EDITOR,—If sleep studies are worth doing, they are worth doing well. The study of sleep at the David Lewis Centre is a shining example of good practice. Despite the challenges involved, the Centre has not only carried out sleep studies on a wide range of children, but has also been led by a team with a strong commitment to the importance of sleep in children’s health and development. The Centre’s approach to sleep research has been innovative and evidence-based, and has contributed significantly to our understanding of sleep disorders in children.

The study of sleep at the Centre has involved a range of methods, including polysomnography, electroencephalography, and actigraphy. These methods have been rigorously applied, and the results have been interpreted in a meaningful way. The Centre’s emphasis on the importance of sleep in children’s health and development has also been reflected in the Centre’s involvement in a range of other research activities, including the development of new therapies for sleep disorders.

The Centre’s approach to sleep research has been successful, and has been applauded by a range of professionals and organisations. The Centre’s success has been due in part to its commitment to evidence-based practice, and its dedication to the importance of sleep in children’s health and development. The Centre’s work has also been recognised by a range of awards and accolades.

The Centre’s success has been due in part to its commitment to evidence-based practice, and its dedication to the importance of sleep in children’s health and development. The Centre’s work has also been recognised by a range of awards and accolades.


Spacers and holding chambers: Not the last word, we hope

EDITOR,—Zah and colleagues compared homemade spacers with two commercially available valved holding chambers (VHCs) for the treatment of children with acute asthma.1,2 As the manufacturer of one of the VHCs that was evaluated, we are concerned about the support to the hypoth- esis, given by implication in this paper, that coffee cup or drink bottle spacers are as effective as properly designed add on devices.

In this paper, the production technique did not simulate the release of medication from a pressurised metered dose inhaler (pMDI). Instead, the technique created a radio labelled aerosol by photographic nebulisation into a bag (which would have acted as a particle pre-selector). This set up would not have reproduced accurately the ballistic component (polyspersed particles that is inevitably released at actuation of a pMDI) that the dynamic aerosol behaviour (inertial deposition, etc) following actuation into the chamber would have been quite different to that observed by having patients drawing in the already formed aerosol from the nebulisation bag. Simply put, the protocol more closely simulated a continuous jet nebuliser releasing a liquid phase aerosol into a bag that was then connected to a chamber/spacer device and may therefore have little relevance to what occurs inside a VHC used with a pMDI. A well designed holding chamber (with a valve) will retain a significant portion of the core component of the emitted dose (parti-
circles greater than about five microns aerodynamic diameter) from the pMDI. A spacer (homemade or otherwise) will not perform this function effectively. Rather, it will momentarily contain the aerosol and then deliver particles of all sizes to the well coordinated patient who is able to time inhalation with actuation of the pMDI. In the case of corticosteroids, the emitted coarse particles can promote local topical infections—such as, oral candidiasis, as well as increases in overall systemic absorption.

The inhalation valve, which distinguishes a VHC from a spacer, needs to be a carefully designed component whose function is to retain the aerosol once created following actuation of the pMDI, then release it during the inspiratory cycle. Many children, particularly those with an acute exacerbation of asthmatic symptoms, have poor coordination, and are therefore likely to mistime inhalation with pMDI actuation. These patients, who are at greatest risk, are thus likely to derive least benefit from the use of homemade spacers.

Although we have other observations of a technical nature, the information given here should be sufficient to provide the message that this study should not be taken as the final word but rather as a finding concerning the debate about the efficacy of homemade manufactured add on delivery devices for use in pMDI based treatment.

That said, if a VHC is unavailable for whatever reason, an empty drinking bottle may be better than nothing at all.

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BOOK REVIEWS


Given the wide prevalence of feeding problems in children and their potential impact on health, it is important for all health professionals working with children to gain an understanding of feeding difficulties. In several chapters of this book there is a refreshing focus on the role of organic factors in feeding problems, which may highlight the wide range of subtle organic features that can contribute to and exacerbate feeding difficulties in children. The impact of other factors on feeding is also covered—for example, the effect of temperament, appetite, growth, developmental stage, prior experience with foods, and cognitive development, all of which are critical in understanding each child’s feeding difficulty and creating appropriate intervention strategies.

The various theories of feeding difficulties from physiological (oral motor, regulatory, neurological), psychological (behavioural, cognitive behavioural, and psychoanalytical) and cultural perspectives are covered. These are discussed with reference to multidisciplinary teamwork and the development of both hospital and community feeding services. The chapter covering the psychoanalytical perspective sits somewhat oddly within the context of the book. Less helpful advice and practical intervention techniques stem from this chapter than the others, but perhaps those with an interest in psychoanalysis will find it an appealing diversion.

It is vital that health professionals in this field develop an understanding of the impact of cultural factors, from the effect of cultural feeding practices on feeding difficulties, to the perception and importance of food and feeding within cultures. This is critical in understanding the factors that contribute to the development and maintenance of feeding problems in children, and is also essential to facilitate culturally sensitive intervention strategies. The perspectives of Indian culture are discussed and whilst one text alone cannot cover the breadth of multicultural issues that are relevant to the UK population, there is useful information on issues which are specifically related to cultural practices and those which are related to social disadvantage and poverty in general.

Whilst some chapters focus on clinical practice and opinion that may not appeal to an academic audience, practical advice, such as special issues in tube feeding, neurological impairment, and chronic illness, combined with generally sound theoretical discussion, makes this text a useful resource for health professionals involved in the assessment or treatment of feeding difficulties.

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Share prices of dot.com companies have plummeted because, we are told, there are too many players in the market place for them all to be viable. The dot.com bubble has burst. This may also be true of paediatric textbooks.

Such thoughts might trouble the authors and publisher of the fourth edition of the

CORRECTION

In a recent letter by Russell and Gillett (Arch Dis Child 2000;85:456), the sentence: "The in house assays used for AGA and EmA were performed on 10–20 ml of serum or plasma; thus capillary samples were more than adequate.” should have read: “The in house assays used for AGA and EmA were performed on 10–20 microlitres of serum or plasma; thus capillary samples were more than adequate”. We apologise for this error.
Use of cyclosporin A as a steroid sparing agent in cystic fibrosis

G K BHAL, S A MAGUIRE and I M BOWLER

Arch Dis Child 2001 84: 89
doi: 10.1136/adc.84.1.89

Updated information and services can be found at:
http://adc.bmj.com/content/84/1/89.1

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