LETTERS TO THE EDITOR

The place of computed tomography and lumbar puncture in suspected bacterial meningitis

EDITOR,—We should like to respond to the recently published annotation on the place of computed tomography and lumbar puncture in suspected bacterial meningitis.[1]

The table of contraindications to lumbar puncture in the child with suspected acute bacterial meningitis is welcome and we would agree that lumbar puncture should be avoided in these clinical situations. However, we would not accept that a contraindication to lumbar puncture amounts to a specific indication for computed tomography, which seems to be the inference. We would agree that computed tomography is indicated if the differential diagnosis of bacterial meningitis is in any doubt but this applies irrespective of whether lumbar puncture is contraindicated. We think one should endeavour to separate the contraindications to lumbar puncture from the indications for computed tomography.

D C DAVIDSON
H CARTY
Alder Hey Children's Hospital, Eaton Road, Liverpool L12 2AP

1 Mellor DH. The place of computed tomography and lumbar puncture in suspected bacterial meningitis. *Arch Dis Child* 1992; **67**: 1417–9.

Dr Mellor comments:
I have to disagree with Drs Davidson and Carty as I believe that computed tomography is indicated in these children. With the exception of septic shock, all the contraindications to lumbar puncture given in my annotation are clinical features suggestive of raised intracranial pressure in a child with suspected bacterial meningitis. In this situation the diagnosis of bacterial meningitis cannot be confirmed because lumbar puncture is contraindicated. Antibiotic treatment must be given promptly but some doubts have to be entertained about the diagnosis even by the experienced paediatrician. Some of the conditions that may mimic the presentation of bacterial meningitis with raised intracranial pressure (posterior fossa tumours, acute hydrocephalus, cerebral abscess, intracranial bleeding) require early diagnosis for appropriate management. This can be achieved safely by computed tomography.

Rapid diagnosis of malignancy using flow cytometry

EDITOR,—The paper by Williamson *et al* on flow cytometric diagnosis of malignancy illustrated some of the well known values of this aid to diagnosis.[1] However, although they did not state directly that their approach provided proof of malignancy, it is worth reminding clinicians that it is usually inappropriate to make the diagnosis of malignancy by immunophenotyping alone.

Others have shown large numbers of CD10, CD19, terminal transferase (Tdt), and HLA-DR positive lymphoid cells in the bone marrows of children with non-malignant disorders such as transient red cell aplasia and thrombocytopenic purpura as well as a range of non-haemopoietic tumours[2] which could lead the unwary into making spurious diagnoses of leukaemia. Until large numbers of reactive nodes have been studied it may remain difficult to distinguish them from a greater variety of lymphomas than T cell lymphoma and Hodgkin's disease. In cases where the diagnosis of non-Hodgkin's lymphoma (NHL) has been made *by other methods*, this approach does enable subclassification to be carried out. Demonstration of monoclonal surface immunoglobulin (the diagnostic hallmark of B-NHL) is virtual proof of malignancy, provided light chain restriction is found. This is one of the few circumstances in which immunophenotyping can by itself reveal malignancy in childhood.

Similarly, within the non-haemopoietic tumours this approach also has benefits and limitations. UJ13A, so useful in detecting neuroectodermal cells, will also react with Ewing's sarcoma[3] and rhabdomyosarcoma[3,4] as will antibodies to vimentin which also react with lymphoid tumours.[3] If carefully constructed panels are used the results may still help the pathologist/haematologist assign lineage.

These caveats should be appreciated by clinicians who should resist the temptation to rely too heavily on surface marker studies, at the expense of histological and cytological appearances, as an indication of malignancy. I fully support the addition of immunophenotyping of fresh cell suspensions to the battery of currently available diagnostic techniques.

M M REID
Department of Haematology, Royal Victoria Infirmary, Newcastle upon Tyne NE1 4LP

1 Williams DM, O'Connor S, Grant JW, Marcus RE, Broadbent V. Rapid diagnosis of malignancy using flow cytometry. *Arch Dis Child* 1993; **68**: 393–8.
2 Longacre TA, Foucar K, Crago S, *et al*. Hematogones: a multiparameter analysis of bone marrow precursor cells. *Blood* 1989; **73**: 543–52.
3 Kemshead JT, Clayton J, Patel K. Monoclonal antibodies used for the diagnosis of the small round cell tumors of childhood. In: Kemshead JT, ed. *Pediatric tumors: immunologic and molecular markers*. Boca Raton, Florida: CRC Press Inc, 1989: 31–45.
4 Reid MM, Saunders PWG, Bown N, *et al*. Alveolar rhabdomyosarcoma infiltrating bone marrow at presentation: the value to diagnosis of bone marrow trephine biopsy specimens. *J Clin Pathol* 1992; **45**: 759–62.

Prepubertal height velocity references over a wide age range

EDITOR,—The construction of new, prepubertal height velocity reference values to take account of early and late developers is welcome[1] but does not overcome the fundamental problem inherent in using *any* velocity standards to describe short term growth in an individual child. We showed that even in experienced hands, a 5 year old child estimated to be growing at the 25th centile for velocity, may in fact lie anywhere from around the 10th to the 50th centile.

The reference to our work is inaccurate. We did not state that 'velocity is unstable over time'. We stated that we had found no significant correlation between two consecutive 12 month velocity values, which is not surprising in view of the unavoidable imprecision of height measurement.[2,3] We would like to stress again the serious limitations of using short term velocity to access the growth of a child.

L D VOSS
The Wessex Growth Study, Room CD53, Southampton General Hospital, Southampton SO9 4XY

1 Rikken B, Wit JM. Prepubertal height velocity references over a wide age range. *Arch Dis Child* 1992; **67**: 1277–80.
2 Voss LD, Bailey BJR, Cumming K, Wilkin TJ, Betts PR. The reliability of height measurement (the Wessex growth study). *Arch Dis Child* 1990; **65**: 1340–4.
3 Voss LD, Wilkin TJ, Bailey BJR, *et al*. The realiability of height and height velocity in the assessment of growth (the Wessex growth study). *Arch Dis Child* 1991; **66**: 833–7.

Drs Rikken and Wit comment:
We fully agree with Dr Voss that the variability of subsequent height velocities seriously limits the diagnostic power of one whole year height velocity in a clinical setting. When stating that height velocity is not very stable over time, we think that we have accurately, though indeed not literally and somewhat understated, referred to the work of Dr Voss and collaborators.

The main purpose of our velocity standards was not to label short term growth of an individual child as good or poor, but rather to supply a tool for analysing growth velocity before and during treatment in groups of prepubertal children of different ages. We think that in such growth studies height velocity SD score is a useful parameter of the growth response, despite its obvious limitations in terms of accuracy.

Secondary thrombocytosis

EDITOR,—We read with interest the paper by Vora and Lilleyman on secondary thrombocytosis in children.[1] As stated by the authors in their article, several recent studies have focused on the role of interleukin-6 (IL-6) in stimulating platelet production: in particular, thrombocytosis was observed in IL-6 transgenic mice,[2] and administration of IL-6 in primates induced bone marrow thrombocytopoiesis and increased platelet counts.[3]

One of the disease conditions associated with marked increase in platelet count is systemic onset juvenile chronic arthritis (JCA). We have recently analysed IL-6 concentrations in patients with systemic onset JCA, using a hybridoma growth assay with the murine hybridoma B9, and found significantly increased serum and synovial fluid IL-6 concentrations in patients with active disease.[4] Serum IL-6 concentrations were significantly correlated with platelet counts ($n=38$, $r=0{\cdot}554$, $r^2=0{\cdot}307$, $p<0{\cdot}001$). The determination coefficient (r^2) for the association of platelet counts with serum IL-6 concentrations implied that approximately 31% of the variability of platelet counts depends upon changes in serum IL-6 concentrations. Therefore, our data support the hypothesis that increased IL-6 production plays a part in the thrombocytosis observed in patients with systemic onset JCA, and possibly in other inflammatory diseases.

FABRIZIO DE BENEDETTI
ALBERTO MARTINI
Clinica Pediatrica, IRCCS Policlinico San Matteo, P le Golgi 2, 27100 Pavia, Italy

1 Vora AJ, Lilleyman JS. Secondary thrombocytosis. *Arch Dis Child* 1993; **68**: 88–90.
2 Suematsu S, Matsuda T, Aozasa K, *et al*. IgG1 plasmocytosis in interleukin 6 transgenic mice. *Proc Natl Acad Sci USA* 1989; **86**: 7547–51.
3 Asano S, Okano A, Ozawa K, *et al*. In vivo effects of recombinant human interleukin 6 in primates: stimulated production of platelets. *Blood* 1990; **75**: 1602–5.
4 De Benedetti F, Massa M, Robbioni P, Ravelli A, Burgio GR, Martini A. Correlation of serum interleukin 6 levels with joint involvement and thrombocytosis in systemic juvenile rheumatoid arthritis. *Arthritis Rheum* 1991; **34**: 1158–63.

Extreme thrombocytosis as a diagnostic clue to hepatoblastoma

EDITOR,—In the recent article describing an extensive survey of thrombocytosis in Sheffield Children's Hospital over a 12 month period, Drs Vora and Lilleyman identified infection, trauma, and malignant disease/chemotherapy as the three commonest causes.[1] Most, if not all, of the children with malignant disease were recovering from a course of chemotherapy ('marrow rebound').

We would like to point out that very high platelet counts, including some in the 'platelet millionaire' subgroup, occur in children with the malignant liver tumours, hepatoblastoma, and hepatocellular carcinoma, before the institution of chemotherapy. The table shows the incidence of platelet counts over 500×10^9/l and over 800×10^9/l in children with these two tumours who are registered in the SIOP (Société Internationale d'Oncologie Pediatrique) liver tumour study, 'SIOPEL-1'. In our experience, patients with other forms of malignant solid tumour rarely have platelet counts in excess of 500×10^9/l and virtually never in excess of 800×10^9/l. Thus, the platelet count may be a strong diagnostic pointer in a child with a newly diagnosed upper abdominal mass.

Platelet counts in patients with hepatoblastoma and hepatocellular carcinoma

	Hepatoblastoma	*Hepatocellular carcinoma*
Total No of patients	99	29
No (%) with platelet counts:		
$>500\times10^9$/l	35 (35)	7 (24)
$>800\times10^9$/l	29 (29)*	3 (10)
Range ($\times10^9$/l)	517–1740	545–998

* Ten patients have platelet counts $>1000\times10^9$/l.

Presumably these two forms of hepatocellular tumour produce a thrombopoietin which circulates and stimulates megakaryocytopoiesis. There is some in vitro evidence to support this contention.[2]

E A SHAFFORD
J PRITCHARD
(On behalf of the SIOPEL-1 trial committee)*
Clinical Department of Paediatric Oncology, First Floor, Lucas Block, St Bartholomew's Hospital, London EC1A 7BE

*Other committee members are C Dicks-Mireaux, J L Habrand, J Keeling, G E Perilongo, J Plaschkes, P Pontisso, and A Vos.

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1 Vora AJ, Lilleyman JS. Secondary thrombocytosis. *Arch Dis Child* 1993; **68**: 88–90.
2 Nickerson HJ, Silberman TL, McDonald TP. Hepatoblastoma, thrombocytosis, and increased thrombopoietin. *Cancer* 1990; **45**: 315–7.

Cycle helmets

EDITOR,—I have been worried about cycle helmets for several years and was delighted to read the balanced discussion by Rogers,[1] which followed articles by Trippe,[2] McCarthy,[3] and Illingworth[4] in the *BMJ*. Whereas the case for helmets for motor cyclists is clearly established, the protection afforded pedal cyclists is not so certain. Furthermore, pedal cyclists have higher mortality and morbidity on our roads.

The British Standard 6863-89 applies only to children's cycle helmets and there appear to be no British Standards for adult and teenager size cycle helmets. In spite of this fact, attractive, light, perforated polystyrene cycle helmets are sold in high street retailers for £30–£60. These helmets bear only 'Ansi Z90.4' and 'Snell B.90' standards and a warning to the effect that the helmet will not prevent serious head injury in a road traffic accident. In contrast motorcycle retailers sell helmets which do bear British Standards. The cheaper and lighter helmets, BS6658-85, 'Type B', can cost as little as £25–£35, weigh about a kilogram, and allow good hearing.

While young children who cycle do not often take to the main roads to 'play with the traffic', older teenagers, like adults, do. In these circumstances a stronger helmet is appropriate. If a teenage cyclist wishes to reduce his or her risk of sustaining a serious head injury on public roads I suggest a suitable, that is 'motorcycle', helmet is worn.

WILLIAM WHITEHOUSE
The Children's Hospital, Ladywood Middleway, Ladywood, Birmingham B16 8ET

1 Rogers M. Cycle helmets. *Arch Dis Child* 1993; **68**: 237–9.
2 Trippe HR. Helmets for pedal cyclists. *BMJ* 1992; **305**: 843–4.
3 McCarthy M. Do cycle helmets prevent serious head injury? Cycling without helmets. *BMJ* 1992; **305**: 881–2.
4 Illingworth C. The argument for helmets. *BMJ* 1992; **305**: 882–3.