Tests for growth hormone secretion

SIR,—Professor Brook and Dr Hindmarsh claim that children growing at a less than 3rd centile velocity carry a 97% chance of showing an abnormality on investigation.1 In a leading article in the *British Medical Journal* in 1986 they wrote: "If a third centile velocity is chosen for immediate action the chances of investigating a normally growing child are only 3%." The latter statement is capable of two interpretations. It could mean that 3% of normal children would be investigated, which is true. It also could be taken to mean that 3% of investigated children would be normal, which is not true, unless by chance. Only this second interpretation, however, fits with the assertion that 97% of investigated children would be abnormal.

The percentage of children below the third centile who are abnormal is:

\[
\text{Number of abnormal children in the group (in 3rd centile)} \times 100
\]

Total number of abnormal + normal children in the group

Growth chart centiles concern only normal children. They cannot tell us about the number, or even the existence, of abnormal children and therefore cannot provide the figures necessary for the calculation.

The chances of finding an abnormality on investigation depend on the sensitivity of the methods of investigation, and on what proportion of those perceived as having the problem have the problem because it and its proportion represent simply the extremes of biological variability. Brook and Hindmarsh give no indication that they have taken these factors into account at arriving at their figure of 97%.

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Professor Brook and Dr Hindmarsh comment

We thank Dr Addy for his interest and we accept his point.

In practical terms it makes not the slightest difference because the total number of abnormal children will so greatly outweigh the number of normal children that the fraction he gives will approach unity or 100%, which is the point we were trying to make.

Gut blood flow velocities in the newborn: effects of patent ductus arteriosus and pararenteral indomethacin

SIR,—The paper by Coombs et al claims to show indomethacin has direct effects on the splanchnic circulation that are independent of its desired effect, that is, closure of the duct.1 Indomethacin is such a widely used and important drug that such a claim must be carefully evaluated.

The observed effects of drug administration were a decrease in splanchnic pulm flow velocity with a change to antegrade diastolic flow by one hour. In the group given a rapid bolus the splanchnic velocity fell further and more rapidly; it is claimed that this is due to splanchnic vasoconstriction. The evidence provided does not support this. The conclusions are pre-

sumably based on the assumption that left ventricular stroke volume does not change after indomethacin administration. In fact several papers have shown that left ventricular stroke volume falls dramatically, with a fall in splanchnic aortic velocity, if the duct closes.2,3

An abnormally raised cardiac output returns to normal. The decrease in splanchnic mesenteric flow velocities observed in this study could therefore merely reflect aortic flow changes secondary to rapid ductal constriction. The observed velocity changes could have occurred in the descending aorta, the renal arteries, and even the femoral arteries, in fact in any systemic artery. Indomethacin normally closes the duct; therefore, to study its generalised effects, the haemodynamic consequences of ductal constriction must be taken into consi-

eration. The observation that the fall in gut flow velocities decreases with second and third doses could be explained by the duct becoming progressively smaller and therefore the haemodynamic consequences of ductal constriction becoming less marked.

The suggestion that rapid administration of indomethacin causes an undesirable fall in splanchnic circulation is probably a misinterpre-

The World Health Organization/United Nations Children's Fund (UNICEF) Collaborative Study of the Use of Indomethacin for Closure of Patent Ductus Arteriosus in Neonates shows that 97% of newborns with ductus arteriosus will have ductal closure within 48 hours of indomethacin administration.4 When we compared the results of serial ultrasound examinations of the ductus arteriosus before and after indomethacin administration, we found that there was a significant increase in ductal diameters in 97% of newborns.5 These results support the observations of the World Health Organization/UNICEF Collaborative Study and do not support the claim made by Coombs et al.6

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1 Coombs RC, Morgan MEI, Durbin GM, Booth IW, McNish AS. Gut blood flow velocities in the newborn: effects of patent ductus arterio-


Hyperinsulinaemic hypoglycaemia in small for dates babies

SIR,—The paper by Collins et al on hypo-

glycaemia in the small for dates infant raises two important issues about the pathogenesis

and hence management of such infants.1 The authors suggested that the low glucose concentra-

tion in the subgroup without overt evidence of hyperinsulism might be explained by a transient deficiency in glucagon secretion.2 This implies that they believe that the remaining

infants had normal plasma glucagon concentra-

tions. However, it is not equally likely that a proportion of their 'hyperinsulinaemic' group were also relatively deficient in this vital glucagonomic hormone? Thus could not the persistency of the fetal insulin effect be due to the influence of the normal postnatal surge of glu-

cagon release? In the absence of glucagon, the key enzymes of the glucagonomic pathway (for example, phosphoenol pyruvate carboxy-

kinase) would be inoperative and it has recently been shown that glucose-6-phos-

phatase also requires glucagon for catalytic activity.3

The second and related issue is that given the wealth of theoretical evidence of the poten-
tial importance of this hormone, why is the glycaemic response so poor after an intramus-

cular injection? In pilot studies before the original paper on transient glucagon defi-


citry,1 I observed that infants who failed to respond to intramuscular glucagon neverthe-

less showed a brisk, sustained rise in peripheral plasma glucose concentration after an 1 mg/kg bolus (200 mg/kg). The most likely explanation is that the sustained peak plasma concentrations of this hormone after intravenous injection might be sufficient to raise the concentration in the portal vein above the local insulin concentrations and thereby reverse the direction of net hepatic glucose flux. Thus the early use of intravenous gluca-

gon in all hyperinsulinaemic infants is likely to shorten their dependence on intravenous glucose supplementation and in addition prevent rebound hypoglycaemia when oral feeding is introduced.

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1 Collins JE, Leonard JV, Teale D, et al. Hyper-


Drs Collins, Leonard, Teale, and Marks comment:

We thank Dr Mehta for his letter. In the original protocol it was planned to measure plasma glucagon concentrations in all the babies, but there was insufficient blood in all cases. We have few samples available to do this. In two patients who were hyperinsulinaemic (cases 6 and 9) glucagon was not detectable in plasma at the time of hypoglycaemia (limit of detection 25 pmol/l). These results are consistent with the hypothesis that the hyperinsulinaemic babies were relatively glucagon deficient as well.

Development of intestinal motility

SIR,—In Dr Bisset's article on development of intestinal motility he notes that little is known of the development of colonic motility in humans and that most infants pass their first
Tests for growth hormone secretion.

D P Addy

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