and three showed full dilatation on inspection alone. With stretching two children showed full dilatation (one had previously been partial) and six new children showed partial dilatation. A total of 14 children (19%) showed some degree of dilatation. Of the five children who showed full dilatation at any time, one had a loaded rectum, one an abdominal faecal mass, and one both abdominal and rectal loading. Two children had no evidence of faecal loading, one of these had two fresh anal fissures and dilated immediately and the other only dilated on stretching the buttocks.

We cannot rule out coexistent sexual abuse in any child, although no evidence came to light after a detailed history and examination (with most children being examined more than once). No other abnormalities reported in anally abused children³ were apparent with the exception that six of the 14 had superficial fissures in comparison with 15 of 58 children without anal dilatation.

The time at which some degree of anal dilatation occurred without stretching was variable, but all those who dilated did so within approximately 30 seconds. In two children the signs persisted throughout the 60 seconds (one full, one partial), in three (one full, two partial) the dilatation disappeared within 2–3 seconds, and in two dilatation appeared at 30 seconds (one full, one partial) and persisted.

We thus agree with Dr Clayden's finding that anal dilatation is a feature seen in constipation and is not related to anal treatment. In this delicate and difficult field we would urge all workers to define precisely what they mean by dilatation. Only then can the relationship between such signs and constipation or sexual abuse be fully elucidated.

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Urinary creatinine excretion in the newborn

Sir,

In their study of creatinine excretion in the newborn Al-Dahhan *et al*¹ give a mean excretion rate and derive a normal range. They then draw the conclusion, 'that infants of postconceptional age 198–290 days may be regarded as

belonging to a single population with respect to creatinine excretion factored by weight', from a regression plot of creatinine excretion in $\mu\text{mol/kg/day}$ against postconceptional age. This is described as showing 'no significant relationship ($r=0.19$, $p=\text{NS}$)'. The positive correlation that exists is ignored by these workers because, in their study sample, the relationship fails to reach significance. Unfortunately the p value is not quoted.

A positive correlation, however, between daily creatinine excretion factored by body weight and postconceptional age is also suggested by the difference in mean daily creatinine excretion in the sample studied by Al-Dahhan *et al*¹ (90 $\mu\text{mol/kg/day}$), and that studied by Sutphen² (71 $\mu\text{mol/kg/day}$). In the former study mean postconceptional age was 34 weeks, in contrast to 30 weeks in the latter. This difference is commented on by Al-Dahhan *et al* with surprise.

Our own study of creatinine excretion measured over 89 days in 31 babies of a mean postconceptional age of 29 weeks showed a mean excretion rate of 71 $\mu\text{mol/kg/day}$, a figure identical to that of Sutphen. Our study also showed a positive correlation between creatinine excretion factored by body weight and postconceptional age that failed to reach significance ($r=0.2$, $p=0.1$) (fig 1).

To explore this issue further we have analysed data pooled from the three previously reported studies of creatinine excretion in the newborn,^{1–3} and compared them with our own measurements. Each of these studies individually, including our own, has a comparatively small sample size. Analysis of the published summary statistics (table) shows that creatinine excretion factored by body weight does increase with postconceptional age (fig 2). The relationship is described by the following equation, which was derived using weighted least squares, with the sample sizes used as weights: creatinine excretion ($\mu\text{mol/kg/day}$) = $55.2 + 0.13$ postconceptional age (days). The coefficient of postconceptional age is significant at less than 2%.

This is an important conclusion and one that is at variance with that of Al-Dahhan *et al*. Creatinine excretion factored by body weight is an index of the relative amount

Fig 1 Weighted regression of mean daily creatinine excretion ($\mu\text{mol/kg/day}$) on postconceptional age (days). $y=10.59+0.3x$, $r=0.2$, $p=0.1$.

Table Analysis of published papers

Author	No studied	Mean creatinine excretion ($\mu\text{mol/kg/day}$)	Postconceptional age (days)
Modi	89	71	204
Sutphen ²	15	71	211
Brion <i>et al</i> ³	42	85	216
Brion <i>et al</i> ³	63	97	228
Al-Dahhan <i>et al</i> ¹	84	90	238
Brion <i>et al</i> ³	27	106	282
Brion <i>et al</i> ³	22	110	330
Brion <i>et al</i> ³	13	89	367
Brion <i>et al</i> ³	35	120	519

Fig 2 Weighted regression of pooled data; daily creatinine excretion ($\mu\text{mol/kg/day}$) on postconceptional age (days). $y=55.2+0.13x$, $r=0.8$, $p=0.01$.

of muscle in the body⁴; the implication of our conclusion is that the proportion of body weight that is muscle increases from 29 weeks' postconceptional age. This is in keeping with the percentage increases that is known to occur at later ages—that is, from 25% at full term, to 45% at puberty.⁴

We do not feel it possible to derive a normal range from the summary statistics in the absence of the raw data. We also question attempts to draw population directed conclusions from studies of small sample size. Collaboration between the groups who have published would seem a better approach to estimate population characteristics with reasonable accuracy.

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Dr Haycock comments:

The exact correlation coefficient (r) for the relationship between postconceptional age and creatinine excretion ($U_{cr.V}$) per unit weight was 0.187 ($n=84$), therefore $V=82$ and the corresponding p value is 0.0884 (as could have been obtained by calculation or from statistical tables by any interested reader). Although it may be argued that this is not far short of the chosen significance value ($p<0.05$), it also allows one to calculate the value of the coefficient of determination (r^2) as 0.035; in other words, even if the relationship is 'real', less than 4% of the variability of the dependent variable ($U_{cr.V.kg^{-1}}$) is accounted for by the value of the independent variable (postconceptional age), a relationship to which it is difficult to give much physiological weight.

The difference between the values for mean $U_{cr.V.kg^{-1}}$ found in our study and those of Sutphen¹ and Modi and Hutton cannot be explained by the difference in mean postconceptional age. The youngest 20 infants in our series had a mean postconceptional age of 210 days, identical to that reported by Sutphen and close to that of Modi and Hutton. The arithmetic and geometric mean and range (mean and two standard deviations on either side of the mean) for these infants were 87.6 (35.6–139.5) and 84.4 (49.4–144.3) $\mu\text{mol/kg/day}$, respectively, hardly different from the values for the group as a whole and substantially greater than those reported by these other authors. As mentioned in our paper (but not commented on by Modi and Hutton), the differences might also be accounted for,