

and may be detected in the circulation many weeks after infusion.<sup>3</sup> This long intravascular life is certainly undesirable and particularly so when the agent is used in healthy volunteer donors. The prolonged circulation of hetastarch may well have contributed to the extraordinary persistence of the pruritus in our cases. We believe that less persistent agents should be used: dextran 70 would be suitable but might increase the risk of anaphylaxis or, alternatively, hetastarch might be modified to increase the speed at which it is degraded.<sup>4</sup>

Pruritus appears to occur only in those donors who have received more than one litre of hetastarch within a short time. We would suggest that, if a donor is to give granulocytes on more than one day in any week, a formula devised to reduce the exposure to hetastarch should be used. Mischler<sup>5</sup> recommended a regimen of 500 ml on day one, 300 ml on day two, and 200 ml on day three, or a dose based on the donor's erythrocyte sedimentation rate after previous administration of hetastarch.

It is important to highlight this problem so that volunteer donors may be made aware of possible consequences of donating granulocytes. We noted that the donors were reluctant to attribute the itching to the procedure, even when they were doctors. We expect that many similar cases will be found once this problem is made known.

The Committee on Safety of Medicines and the distributor have had no other reports of this side effect of hydroxyethyl starch.

<sup>1</sup> McCredie JB, Freireich EJ, Hester JP, Nallejos C. Increased granulocyte collection with the blood cell separator and the addition of etiocholanone and hydroxyethyl starch. *Transfusion* 1974;**14**:357-64.

<sup>2</sup> Bode U, Desserth AB. Donor toxicity in granulocyte collections. Association of lichen planus with the use of HES plasmaphoresis. *Transfusion* 1981;**21**:83-5.

<sup>3</sup> Boone JC, Jesch F, Ring J, Messmer K. Intravascular persistence of hydroxyethyl starch in man. *Eur Surg Res* 1976;**8**:497-503.

<sup>4</sup> Rock G, Wise P. Plasma expansion during granulocyte procurement: cumulative effects of hydroxyethyl starch. *Blood* 1979;**53**:1156-63.

<sup>5</sup> Mischler JM. New dosage regimes for HES during intensive leucapheresis. *Transfusion* 1978;**18**:126.

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## Serum 25-hydroxy vitamin D in coalworkers and surface workers in winter

In a previous study<sup>1</sup> we found that serum 25-hydroxy vitamin D (25-OHD) concentrations were similar in surface and underground coalworkers and non-miners and concluded that the solar irradiation to which underground workers were exposed between shifts was adequate to maintain vitamin D synthesis in the skin. Since the

observations were made in the summer months, when ultraviolet radiation would have been at its greatest, we thought it important to do a similar study in the winter.

### Subjects, methods, and results

Serum 25-OHD concentration was measured in 60 underground and 28 surface coalworkers working various shifts (see table). Of the surface workers, 13 either had recently retired or were temporarily off work for minor disabilities. The sera had all been taken in November and December 1979 and March 1980 and had been stored at  $-70^{\circ}\text{C}$ . For comparison sera were taken in January and February 1981 from a population of normal adult male day-workers not in the coal industry. Serum 25-OHD concentration was measured by competitive protein binding.<sup>2</sup> Analysis of fresh sera and sera frozen to  $-70^{\circ}\text{C}$  showed that the collection and storage procedures were unlikely to have produced an error of measurement.

The table shows no significant difference in 25-OHD concentrations in sera collected in the winter months from surface and underground coalworkers and from normal subjects not working in the coal industry. The mean concentration in all subjects ( $n=124$ ) was  $59.6 \pm \text{SE } 2.0 \text{ nmol/l}$  ( $23.8 \pm 0.8 \text{ ng/ml}$ ), which is significantly lower ( $p < 0.05$ ) than the mean concentration of  $73.8 \pm 4.9 \text{ nmol/l}$  ( $29.5 \pm 2.0 \text{ ng/ml}$ ) found in the 139 comparable subjects studied in the summer months.<sup>1</sup> This difference between summer and winter was apparent in both non-miners and miners whether they were working above or below ground.

### Comment

The present study shows that there was no difference between serum 25-OHD concentrations in underground and surface miners and other surface workers in the winter months, as was found in a similar study undertaken in the summer months.<sup>1</sup> The higher values found in miners and other workers in the summer months compared with the winter are in keeping with the suggestion that in the summer sufficient ultraviolet light is obtained by underground workers between shifts to maintain vitamin D synthesis in the skin.<sup>1</sup> During the winter months, however, miners working underground are exposed to only small amounts of solar ultraviolet irradiation between shifts. Thus, while we may conclude that coalminers working underground are not short of vitamin D, blood concentrations of this vitamin may be maintained in different ways at different times of the year. The dietary and metabolic implications of this conclusion merit further study.

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<sup>1</sup> Shuster S, Chadwick L, Afacan AS, Robertson MD. Serum 25-hydroxy vitamin D in surface and underground coalminers. *Br Med J* 1981;**283**:106.

<sup>2</sup> Greenberg PB, Hillyard CJ, Galante LS, Colston KW, Evans IMA, McIntyre I. Affinity of calciferol analogues for 25-hydroxy cholecalciferol receptors. *Clin Sci Mol Med* 1974;**46**:143-7.

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Serum 25-OHD concentrations in coalminers and other workers (nmol/l)

	Coalminers									
	Underground shift				Surface shift		Totals			
	0800-1600	1300-2100	2200-0600	0600-1400	0600-1400	Others*	Underground	Surface	Non-miners	
Mean	59.68	53.6	56.45	59.55	63.87	61.13	58.5	62.6	59.2	
SE	10.85	18.18	5.65	4.1	6.05	5.63	3.15	4.1	2.45	
SD	28.7	20.68	12.63	25.88	23.43	20.33	24.33	21.68	16.9	
n	7	8	5	40	15	13	60	28	36	

\*Off work for minor complaints or recently retired.

Conversion: SI to traditional units—125-OHD: 1 nmol/l  $\approx$  0.4 ng/ml.