The median length of treatment was four weeks, ranging from one to six weeks for recombinant tumour necrosis factor α and from one to nine weeks for recombinant interferon gamma. The median cumulative doses achieved were 105 μg (range 10-300) for recombinant tumour necrosis factor α and 1500 μg (range 400-1900) for recombinant interferon gamma.

The toxicity associated with recombinant tumour necrosis factor α was considerable and independent of dose. Six patients had severe rigors. One patient had a cardiovascular collapse with unrecordable blood pressure and pulse after an injection of 10 μg into the lesion. He was resuscitated with intravenous fluids and steroids. A second patient, with cerebral metastases, developed severe rigors, which were followed by generalised convulsions. Treatment with recombinant tumour necrosis factor α was stopped in these two patients and continued with recombinant interferon gamma alone.

Important haematological, hepatic, or renal toxicity was not seen.

None of the subcutaneous lesions injected with recombinant tumour necrosis factor α regressed. One patient was injected twice into the lesion with both cytokines in combination, again with no response. Metastases advanced in more than one site in all patients.

Comment

The toxicity of recombinant tumour necrosis factor α was severe even at small doses. Feinberg *et al*

reported irreversible cortical blindness in a patient with cerebral metastases from adenocarcinoma of the lung after its intravenous administration.⁵ They attributed this complication to cardiovascular toxicity rather than to toxicity to the central nervous system itself. Our results suggest, however, that the toxicity of recombinant tumour necrosis factor α might prohibit its use in the presence of cerebral metastases, which are particularly prevalent in patients with metastatic malignant melanoma.

We conclude that for the dosage and regimen used recombinant tumour necrosis factor α combined with recombinant interferon gamma has no activity against this tumour and that the complications associated with the tumour necrosis factor are considerable.

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Rational restriction of out of hours requests for haematology tests

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In 1985 we introduced guidelines to restrict the demand for requests for haematological tests outside normal working hours in this district general hospital.¹ The demand for on call tests had reached over 700 a month, and the medical laboratory scientific officers were unable to guarantee an adequate on call service. The introduction of the guidelines led to a fall in demand for such tests, which was partly sustained over a year.¹ We report the results after a further two years.

Methods and results

Guidelines on appropriate tests for different clinical conditions and their availability were issued to all house officers. The availability of a test was stated clearly as yes or no for each clinical condition according to whether we believed that its results would appreciably affect the management of a patient during the period outside normal working hours.

The figure shows the demand for such tests during the four years before and three years after the guidelines were introduced compared with the number of patients treated. The rates of increase were obtained from the slopes of the least square fit regression lines. For the three years after the intervention the rate (5.92 tests/month) was almost the same as that for the preceding four years (6.12 tests/month). The 95% confidence interval for the difference between the slopes was -2.07 to 2.41 . As zero difference is near the middle of this interval there is no evidence that the slopes are different.² Assuming that the existing circumstances

continue, the previously intolerable rate of 700 tests a month will be reached within the year.

The correlation coefficient for the ratio of the numbers of tests to patients treated a month gave an R^2 value of 0.27 before and 0.01 after the intervention. Labour costs fell initially by 28%, but previous values were regained within months.

Numbers of requests for haematology tests outside normal working hours and of inpatients treated each month during four years before and three years after introduction of guidelines to restrict demand for out of hours haematology tests

Comment

These consistent rates of increase may be due to the increasing patient workload. Although our statistical analysis was based on crude data, the R^2 values for the variables plotted indicate that between 55% and 65% of the variability in patient turnover and in tests can be attributed to a linear relation with time. We assume that the lack of correlation between the numbers of patients and requests result from the dilution of emergency cases with cold cases. Bed closures during the past three years may have altered this ratio. As there are no data linking an individual request with a particular patient the numbers of emergency cases in which haematology tests are required cannot be studied retrospectively.

Decisions about the future of the out of hours haematology service require precise and more detailed information, which should include the numbers of all types of haematology tests requested for each patient episode or admission. More data than recommended in the Körner report¹ could be collected for this purpose, and local feedback and analysis would be useful. Our guidelines were designed to complement control by clinical audit or education and were expected to improve communication between clinical and laboratory staff. The previous availability of tests depended partly on the experience and compliance of the medical laboratory scientific officer.

The different strategies for reducing demand for

tests have been described.⁴ The effectiveness of our guidelines lie in their reducing the numbers of tests to a reasonable minimal level. Budget holders should realise that a reduction in the number of requests for tests does not necessarily mean corresponding financial savings: medical laboratory scientific officers are paid a flat fee for each call regardless of how many tests they do in each call.⁵ We suggest that payments should be for sessions and unrelated to numbers of requests or calls. This would ensure fixed but fair remuneration, given that our monitoring system or its equivalent were in force. If admissions cannot be restricted adequate on call staffing or totally automated and foolproof counting equipment will be necessary as demand increases.

We thank Mr A J Girling, department of statistics, Birmingham University, for his advice. Copies of the guidelines, though intended only for local use, are available from us.

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Fall in association of height with intelligence and educational level

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Recent British studies have shown a continuing difference in height among social classes,^{1,2} which apparently contrasts with evidence from Sweden.³ We report postwar trends in height as a function of two major correlates of social class—namely, intelligence and educational level—in Denmark.

Methods and results

Our data were derived from the archives of the draft board for eastern Denmark and concerned men born

during 1939-67. On attaining age 18 Danish men are required to appear before a draft board, which assesses their suitability for military service. Less than 8% are exempted, mainly on medical grounds, and for the remainder height, an intelligence test score, and a code to identify educational level (primarily reflecting years of schooling) are recorded. From the archives we obtained these three measures for about 10% of the men born during 1939-58.⁴ These we grouped into four cohorts: 1939-43 (n=7332), 1944-8 (n=9182), 1949-53 (n=7466), and 1954-8 (n=6773). To these four cohorts we added a fifth, comprising men who appeared before the draft board in 1985 (n=13 226),⁵ referred to as the 1964-7 cohort as over 90% of them had been born then.

Although the draft board's intelligence test has remained unchanged since 1957, means of test scores have risen. For analysis of variance we therefore divided each of the five cohorts into those scoring above and below its own median score. The coding for educational level changed between the fourth and fifth cohorts so the fifth cohort was not comparable with the others and was omitted. For analysis of variance educational level for the four cohorts born during 1939-58 was classified according to whether the Danish *studentereksamen* (equivalent to an A level in England, Wales, and Ireland) had been achieved. We also performed correlation analyses with ungrouped scores and codes.

The overall mean heights for the five cohorts increased uniformly from 175.5 cm to 179.8 cm. The table shows the main results. The increasing relative numbers attaining the *studentereksamen* reflected the expansion of higher education over the period. Analysis of variance for the intelligence test score showed a highly significant cohort effect ($F_{4,43969}=668.0$, $p<0.001$), a significant difference between the groups scoring above and below the median ($F_{1,43969}=1505.6$, $p<0.001$), and a significant interaction between groups and cohorts ($F_{4,43969}=6.2$, $p<0.001$). Analysis of variance for the two educational levels also showed likewise a significant difference between the groups ($F_{1,30745}=1168.5$, $p<0.001$) and a

Height in relation to intelligence test score and educational level according to year of birth

Cohort	Group	Mean (SD) height (cm)	Difference between groups	Correlation with height*	Multiple correlation†
<i>Intelligence score</i>					
1939-43	Above median (n=3751)	176.9 (6.5)	2.8	0.269	
	Below median (n=3581)	174.1 (6.4)			
1944-8	Above median (n=4574)	177.9 (6.3)	2.7	0.253	
	Below median (n=4608)	175.2 (6.4)			
1949-53	Above median (n=3802)	178.6 (6.4)	2.1	0.206	
	Below median (n=3664)	176.5 (6.4)			
1954-8	Above median (n=3415)	180.0 (6.6)	2.5	0.211	
	Below median (n=3358)	177.5 (6.6)			
1964-7	Above median (n=6404)	180.9 (6.5)	2.1	0.195	
	Below median (n=6822)	178.8 (6.8)			
<i>Studentereksamen</i>					
1939-43	With exam (n=925)	179.1 (6.0)	4.1	0.283	0.297
	Without exam (n=6407)	175.0 (6.5)			
1944-8	With exam (n=1436)	179.6 (6.1)	3.6	0.265	0.278
	Without exam (n=7746)	176.0 (6.4)			
1949-53	With exam (n=1311)	180.2 (6.2)	3.2	0.234	0.241
	Without exam (n=6155)	177.0 (6.5)			
1954-8	With exam (n=1428)	181.1 (6.6)	3.0	0.228	0.238
	Without exam (n=5345)	178.1 (6.6)			

*All $p<0.001$. †Height with intelligence test score and educational level; $p<0.001$.