later, when nothing was said by the doctor, they repeatedly ignored opportunities to find out about their second son. The parents in family II, even in the period of stress soon after their first son's diagnosis, made the same decision. The actions of these parents actually exposed to the situation seem to me to speak louder than the words of the parents who replied to Professor Beckmann's questionnaire (Dubowitz, 1976a) by saying that they would want to know at birth whether their son was affected. However, the mother in family III suffered uncertainty and fear for a year because of our inexperienced interpretation of an apparently abnormal result. Deliberately leaving the matter unsettled can clearly work both ways. (3) The intelligent, experienced, and informed parents in family I illustrate the difference between genetic counselling to which, after a late start, they were exposed in full measure and compulsory eugenics from which it is tempting to think they might have profited. If they could ignore advice given on the basis of early diagnosis, one must not assume that parents whose child is detected by total population screening, and who will generally not have heard of muscular dystrophy, will react differently. There is no precedent for total population screening of infants with the sole purpose of giving genetic counselling. If it is introduced, its effectiveness will depend on more than just the reliability of the tests. The need for prevention, however, is illustrated by another family.

**Family IV.** Billy was referred at age 4. His abnormal gait was investigated and found to be due to Duchenne muscular dystrophy. There were no previous cases in the family but he already had 2 younger brothers aged 3 and 2 years, both of whom had very high CPK levels. The burden this family will have to bear over the next 15-20 years is appalling.

**DAVID GARDNER-MEDWIN**

*Regional Neurological Centre, Newcastle General Hospital, Westgate Road, Newcastle upon Tyne NE4 6BE.*

**REFERENCES**


**Professor Dubowitz comments:**

I entirely agree with Dr. Gardner-Medwin that cord blood CPK is a useful screen in families at risk, and, like him, I have used it on a number of occasions. However, in view of the higher normal levels in cord blood, with an upper range of about 10 times the adult normal, one should reserve judgement on levels not grossly raised and within the usual infant Duchenne range (say over 1000 IU/l), and should always confirm an abnormal result on a peripheral blood sample. This is well illustrated by Dr. Gardner-Medwin's family III. If a screening programme for the general population were to be introduced in the future, should therapeutic possibilities become available, the only practical approach would be to do it in parallel with the phenylketonuric screen on the same blood sample. For the present I do not think one could justify such a general screening programme for Duchenne dystrophy purely for the purpose of genetic counselling.

**VICTOR DUBOWITZ**

*Department of Paediatrics and Neonatal Medicine, Hammersmith Hospital, Du Cane Road, London W12 0HS.*

**Sir,**

I have read with interest Professor Dubowitz's recent contributions in the *Archives* (1976, 51, 249 and 325). The problem of genetic screening for Duchenne muscular dystrophy (DMD) on a nationwide basis using creatine kinase (CPK) may be effective for case ascertainment, but is certainly tardy preventive medicine. Unless genetic counselling procedures for DMD are re-evaluated and revised, the impact of such a programme would be minimal. The usual counselling techniques are based on the indirect Haldane estimate of spontaneous new mutation rate and assume that approximately one-third of all cases are due to new mutations (Murphy and Mutalik, 1969; Haldane, 1935).

Recent data from studies of the X-linked lethal Lesch-Nyhan disease, as well as from DMD, have questioned the validity of this approach. The frequency of mothers of affected sons showing heterozygosity for hypoxanthine-guanine phosphoribosyl-transferase (HPRT) deficiency is substantially greater than would be expected from theoretical considerations (Francke et al., 1976). Mothers of affected DMD patients seem to show a similar deficiency of new mutants though the data are more inferential since the inborn error has not been defined (Roses, 1976; Roses et al., 1976a, b).

Dubowitz is correct in his statement that a nationwide screening programme may seem meddlesome in a condition where no effective treatment is available... Recent experience with over 50 diseases that can be diagnosed in utero should underscore that the most effective current methods are those of prevention. Carrier detection is the crux of this approach (Milunsky et al., 1970).

While investigators are attempting to define the inborn error in DMD and develop prenatal and carrier identification methods, complete pedigree analyses of families of affected males should be undertaken using presently available techniques. Of course it should be emphasized that until the biochemical defect is defined all methods are inferential. Notwithstanding such criticisms, mothers of affected sons and other female relatives with obviously raised CPK levels are currently being counselled as carriers in most clinics. There are a...