LETTERS TO THE EDITOR

Reply to the commentary on Decruyenaere *et al* "Adolescents' opinions about genetic risk information, prenatal diagnosis, and pregnancy termination"

As psychologists, we are convinced that our discipline has at least three important roles in the field of clinical genetics: (1) participation in counselling aimed at free, informed decision making and at coping better with the genetic risk or the result of genetic testing; (2) description of psychological profiles of patients with a specific genetic disease, including neuropsychological testing; (3) research to obtain insight into people's knowledge, beliefs, feelings, and behaviour related to genetic disease, genetic risk, and genetic testing. "Prediction" of how many people will use specific genetic tests and delineation of predictor variables is part of the latter role.

We want to stress that the mere prediction of future uptake rates or other preventive behaviour is not the main purpose of our study. The study is aimed at a description of adolescents' present opinions about genetic risk information, prenatal diagnosis, and pregnancy termination, as a starting point for setting up an information campaign: "To gain further insight . . . genetic testing" (see Abstract). It does not lead to the conclusion that adolescents show an apparent lack of interest in genetic information. Indeed, one should not extrapolate from other findings about the gap between "intentions and real uptake for specific predictive tests or carrier tests" to conclude that adolescents' self-reported attitudes are an "overestimation of future demand". In this study it may as well be an underestimation, because of the age of the respondents and their lack of experience of life. This may be particularly true with regard to pregnancy termination. Our interpretation of the findings of the study is that "Adolescents in Flanders are interested in being informed about genetic risks and genetic diseases and in making use of prenatal diagnosis because they want to make informed reproductive decisions in the future and to be emotionally prepared for the birth of an affected child" (see Abstract).

The comment that "these results would not apply in countries where fewer people have religious objections to abortion" can be questioned. Although the large majority of the population in Flanders is Roman Catholic, less than 15% of the adolescents reported that they attend church regularly or very frequently. Therefore we think that their objections to pregnancy termination are not purely religious but that they stem from more general negative feelings towards abortion. The commentator's objection that "we do not know what they understood by a severe genetic disorder" has been dealt with in the

discussion of the paper. The adolescents may indeed have had completely different conditions in mind during the interview. The main point of interest, however, is their "subjective perception" of a serious situation.

At the end of the comment the following question is raised: "To what extent do we have a responsibility to provide information that people will not want to act on?". This question is misleading. "Genetic information" and "acting on information" should not be narrowed to decision making concerning a pregnancy termination. The information in education campaigns may elicit different types of actions: seeking additional information about genetic risks, refraining from having children, opting for prenatal diagnosis, a predictive test, or a carrier test . . . or deciding not to use the information. Indeed, the main aim of education campaigns associated with human genetics is to allow people to make free informed choices and genetic centres as well as policy makers have a responsibility in this field. In this respect the finding that adolescents develop a critical attitude when confronted with information about genetic diseases and genetic counselling is positive. Moreover, creating awareness of the psychological and ethical issues connected with genetic technology should be part of any information campaign concerning human genetics.

GERRY EVERS-KIEBOOMS
MARLEEN DECRUYENAERE
MYRIAM WELKENHUYSEN

Psychosocial Genetics Unit,
Centre for Human Genetics,
University of Leuven,
UZ Gasthuisberg, Herestraat 49,
3000 Leuven, Belgium

Glycogen storage disease type II: frequency of three common mutant alleles and their associated clinical phenotypes studied in 121 patients

Glycogen storage disease type II (GSD II, acid maltase deficiency, Pompe disease) is an autosomal recessive trait caused by a deficiency of lysosomal α -glucosidase, leading to a characteristic accumulation of glycogen in lysosomes. Other types of glycogenosis are distinguished by cytoplasmic glycogen accumulation. Three clinical phenotypes are recognised: "infantile" (severe myopathy and

Identification of the wild type and IVS1(-13T→G) (Δ exon2) alleles by ARMS. The normal allele (N) is amplified using 5'TCCCTGCTGTAGCCCGCTTT3' as sense and 5'ACCCCAAGCTTGTGAGGTGC3' as antisense primer. The mutant allele (M) is amplified using the same antisense primer and 5'CCTGCTGTAGCCCGCTT3' as sense primer. The melting temperature for each primer was the same (64°C). The PCR mixture consisted of: 20 mmol/l Tris-HCl (pH 8.4), 50 mmol/l KCl, 1 μ mol/l MgCl₂, 10% DMSO, 0.005% W-1, 250 mmol/l of each dNTP, 1 μ mol/l of each primer, 0.5 μ g template DNA, and 2.5 units Taq DNA polymerase in a final volume of 50 μ l. The PCR conditions were: 5 minutes at 94°C, 5 minutes at 59°C, and 5 minutes at 72°C (one cycle) followed by 2 minutes at 94°C, 2 minutes at 59°C, 3 minutes at 72°C (33 cycles), and ending with 10 minutes at 72°C. The fragments were analysed by 1.5% agarose gel electrophoresis. Lanes 1 and 2, homozygote for wild type allele. Lanes 3 and 4, heterozygote for IVS1(-13T→G) allele. M, marker.

cardiomyopathy with early onset and rapid progression usually leading to death within one year), "juvenile", and "adult" (myopathy with delayed onset and slow progression, no cardiac involvement).

Among the mutations recently discovered in the α -glucosidase gene,¹ three occur with increased frequency: a base substitution in intron 1 (-13T→G) leading to the aberrant splicing of exon 2 (IVS1(-13T→G)),² the deletion of exon 18 (Δ exon18),^{3,4} and the deletion of a single base (Δ T525) leading to premature termination of α -glucosidase synthesis.⁵ Here we report the occurrence of these mutations in 121 patients and compare their frequency in infantile, juvenile, and adult GSD II, in Dutch and non-Dutch populations. The methods for mutation detection were the following. The Δ exon18 and the Δ T525 alleles were identified as recently described by Van der Kraan *et al*³ and Hermans

Table 1 Mutant allele frequency in glycogen storage disease type II

Clinical phenotype	No of patients	Allele frequency		
		IVS1(-13T→G)	Δ T525	Δ exon18
Infantile	26*	0.00	0.35	0.31
	58	0.00	0.16	0.15
	32†	0.00	0.00	0.02
Juvenile	8	0.19	0.19	0.00
	13	0.15	0.15	0.00
	5	0.10	0.10	0.00
Adult	33	0.46	0.15	0.08
	50	0.38	0.11	0.05
	17	0.24	0.03	0.00

* Dutch patients.

† Non-Dutch patients; among the non-Dutch patients were European (35), Asian (7), African Black (1), North African (2), American Black (1), Turkish (6), Lebanese (1), and Cambodian/Finnish (1).