Table 1. Evaluation of antitoxoplasma antibodies.

Antibodies	ELISA IgG	ELISA IgM	Feldman dye test
pre-transplantation	189	negative	64 X
day 143	44	negative	16 X

IgG and IgM antibodies were quantified with use of an ELISA, titers are expressed in units per milliliter (IU/mL). A patient is considered seropositive if titers are over 10 IU/mL. Pre-transplant serologic status positive for IgG but negative for IgM indicated past toxoplasma infection. On day 143, IgG titers decreased and IgM were not still detectable, in spite of definite proof of infection of toxoplasma in multiple tissues. These findings may be a reflection of impaired cellular and humoral immunity after transplantation, and may also indicate serologic status is not an appropriate tool for early diagnosis. The Feldman dye test is a more sensitive and specific neutralization test in which the organisms are lysed in the presence of IgG antibody and complement. The patient is considered to have a chronic infection if titers are over 16 X. In case of acute infection, titers are normally over 1,024 X.

for the life of the host.[5] In the latent infection, parasite-specific T-lymphocytes release high levels of gamma interferon, which is required to activate and synergize macrophages for toxoplasmacidal activity.[5] Therefore, delayed immune reconstitution after transplantation puts patients at risk of reactivation of latent infection. The precise kinetics of immune reconstitution after $CD34^+$ cell-selected PBSCT are unknown, however, substantial T-lymphocyte defects and consequent increased incidence of opportunistic infection have been reported. In our case, it is likely that the combination of $CD34^+$ cell-selected PBSCT and TBI regimen resulted in a further-delayed immune-cell reconstitution and rendered the patient susceptible to disseminated toxoplasmosis. Although more studies need to be done to improve the understanding of immunologic impairment responsible for toxoplasmosis reactivation, prophylactic therapy for toxoplasmosis could be beneficial for seropositive patients especially in cases of $CD34^+$ positive selected transplantation with TBI regimen.

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Key words

CD34 selection; toxoplasmosis; adult T-cell leukemia/lymphoma.

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Frequency of Gilbert's syndrome associated with UGTA1 $(TA)_7$ polymorphism in Southern Italy

We screened 685 subjects from Southern Italy for a promoter polymorphism of the UDP-glucuronosyltransferase (UGTA1) gene tightly linked to Gilbert's syndrome (GS), consisting in the insertion of a TA repeat in the *TATA* box. The frequency of the polymorphism was 0.387 which is similar to the frequencies reported for other investigated populations of different ethnic backgrounds and is consistent with the antiquity of this polymorphism.

Sir,

Gilbert's syndrome (GS) is an inherited form of mild unconjugated hyperbilirubinemia, characterized by decreased bilirubin UDP-glucuronosyltransferase activity (UGTA1). Serum bilirubin levels vary according to time, intercurrent illness or fasting.[1]

The recent identification of the UGTA1 locus, which encodes for a family of UGTA1 isoforms, has provided tools for molecular studies and for the correct definition of inheritance pattern.[2] Although heterozygous missense mutations have been identified in patients with GS, the majority of cases are associated with a length polymorphism in the promoter region. As a matter of fact, an unusual *TATA* box exists in 2 different forms, $A(TA)_6TAA$ and $A(TA)_7TAA$, due to the presence of six or seven TA repeats.[3] The presence of this expanded element reduces the efficiency of transcription of the UGTA1 gene.

The incidence of GS can be evaluated by analysis of the promoter polymorphism; however, it is clear that forms due to exon (1 to 5) mutations may be underevaluated.

The precise incidence of GS is not known, mainly because this condition is difficult to diagnose. After the description of the association of the $(TA)_7$ with GS, some studies focused on the relationship between GS and inherited red cell defects (spherocytosis, G6PD deficiency, thalassemia) and neonatal jaundice.[4-7]

The aim of our study was to establish the gene frequency of the TA repeat promoter polymorphism in a

Southern Italy population.

After being given informed consent we examined 685 subjects (300 males and 385 females) from Southern Italy. By means of polymerase chain reaction and gel electrophoresis the subjects were genotyped for the TA promoter polymorphism.[4] The prevalence of homozygosity for the $(TA)_7$ allele was 15%. Table 1 reports the allele frequencies found in other studies and the present study.

In Caucasian people, the estimated gene frequency of $(TA)_7$ is 0.387. The frequency of the $(TA)_7$ promoter is lowest in Asian (0.16) and highest in African populations (0.426), where two other variants have been identified, $(TA)_5$ and $(TA)_8$, with relative frequencies of 0.035 and 0.069, respectively.[8] Our data are in agreement with data reported by Beutler *et al*.[7] concerning a Caucasian population. The allele frequency in an African population appears the same as that of non-Africans as well as the Sardinian population.[4,7,8] These data are consistent with the oldness of the polymorphism, which appears to be homogeneously distributed in the world.

The result from the Asian population appears discordant; this could be due to the relative low number of subjects and to the relative heterogeneity of the examined population.[8,9] It is noteworthy that a missense Gly71Arg mutation, associated with GS, is present in 19% of the population of Asian origin. Preliminary analysis on Caucasian chromosomes have demonstrated that this polymorphism is very rare (Iolascon *et al.*, unpublished data).

$(TA)_7$ polymorphism is strongly associated with higher bilirubin levels.

The very high prevalence of this polymorphism could be relevant in Mediterranean countries where there is a high incidence of inherited hemolytic diseases. The co-inheritance of GS with a hemolytic red cell defect could account for the heterogeneity of clinical findings (hyperbilirubinemia, gallstones) in affected kindred.[10]

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Key words

Gilbert's syndrome, hyperbilirubinemia, UGTA1, TA repeat.

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Table 1. UGTA1 allele frequencies.

Ref.	*$(TA)_6$*	*$(TA)_7$*	*n° of subjects*
Iolascon	43	57	685 (Italy)
Bancroft (9)	37	63	151 (USA)
Kaplan (5)	37	63	240 (Sephardic J.)
Beutler (7)	38	62	71 (Europe)
Beutler (7)	42	47	101 (Africa)
Beutler (7)	16	84	47 (Asia)
Akaba (8)	7	93	159 (Japan)
Galanello (4)	40	60	70 (Sardinia)

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