Outcomes of kidney transplantation in Greek and Albanian patients: a single centre experience

Vergoulas G, Ioannidis I, Nikodimopoulou M, Miserlis Gr, Solonaki F, Panou E, Posa L, Fousas J, Papagiannis A, Papanikolaou V, Takoudas D

Organ Transplant Unit, Hippokratio General Hospital, Thessaloniki, Greece

Abstract

Background and aim: It has been reported that racial and ethnic (genetic make up), as well as socioeconomic differences may affect the results of kidney transplantation. Socioeconomic factors are quite difficult to differentiate from genetic factors. It is not surprising that a group with poorer access to health care, less private insurance and less income does less well with serious medical problems. The aim of this study was to compare the outcomes of kidney transplantations in Greek (G) and Albanian (A) patients.

Patiets and Methods: Twenty nine transplanted patients of Albanian ancestry were matched with 29 Greek patients retrospectively. Their mean age was 34 (G) and 31 (A) years, there were 21 men and 8 women in each group (G, A) and they received 26 kidneys from living related donors and 3 kidneys from cadaveric donors respectively.

Arterial blood pressure (ABP), body weight (BW), serum creatinine, serum total protein and albumin, total cholesterol, HDL-cholesterol and triglycerides, 24 hour proteinuria were measured on 7th, 15th postoperative day, 1st, 3rd, 6th month and 1st year after transplant. BMI was calculated before and 1 year after transplantation and acute rejection episodes were recorded too. Methylprednizolone (MP), cyclosporine (CsA) dose /kg BW were calculated at baseline, 1, 3, 6, 12 months after transplant. Cumulative patient and graft survival at 1 and 5 years were calculated too.

Results: Patient survival at 1 and 5 years was 100% / 93.1% and 100% /93.1% respectively (p: NS). Graft survival at 1 and 5 years was 100% / 93.10% and 93.75% / 86.45% respectively (p: NS). BW (but not BMI) and total cholesterol levels in Greek patients were higher compared to those of Albanian patients during the 1st post transplant year (p: 0.044 and p: 0.021 respectively). MP dose in A patients was higher during the first year (p: 0.05).

Conclusion: Patients and graft survival do not present difference between G and A patients. There is significant difference on cholesterol profile between G and A patients. A larger number of transplants are possibly needed to allow us to draw firm conclusions. Hippokratia 2008; 12 (3): 176-180

Key words: kidney, transplantation, Greek patients, Albanian patients, patient survival, graft survival

Corresponding author: Vergoulas G, 53, Alkminis Street, 54249 Thessaloniki, Greece, Tel: +30 2310 302311, e-mail: geover@otenet.gr

Introduction

Kidney transplantation is the treatment of choice for patients with ESRD since it presents better survival and quality of life[1]. It has been reported that racial and ethnic (genetic make up), as well as socioeconomic differences may affect the results of kidney transplantation. Socioeconomic factors are quite difficult to differentiate from genetic factors. It is not surprising that a group with poorer access to health care, less private insurance and less income does less well with serious medical problems[2]. It has been reported by American studies that blacks have an incidence of renal failure much greater than that in white Americans[3]; and the same is true for kidney transplantation[2], a fact that has been disputed by a recent European study[4].

Albania remains the European poorest country and a continuous source of legal and illegal economic immigrants into Greece and other countries. Albanians serve as a mainly cheap, unskilled labor that has helped fuel a boom in Greek's economy. In spite the fact that wages earned in Greece are 4-6 times higher than those that might be earned at home Albania, there is poorer access of Albanian immigrants to health care, less private insurance and less income compared to Greek residents. For the above reasons (ethnic difference and socioeconomic status) we decided to compare the outcomes of kidney transplantations in Greek and Albanian patients.

Patients and Methods

Six hundred and twelve kidney transplantations were performed from 20.4.1994 to 26.10.2005 in Hippokratio General State Hospital. Among them there were twenty nine transplants on Albanian patients, most of them economic immigrants. Their mean age was 31 years and there were 21 men and 8 women. They received 26 kid-

neys from living related donors and 3 kidneys from ca-daveric donors. All of them were on hemodialysis before transplantation.

In order to evaluate this cohort of patients we se-lected 29 patients of Greek ancestry matched to sex, age, weight, donor age and sex, dialysis duration and time of transplantation (Table 1) to compare the outcome (patient

Table 1: Patients' baseline data

|	**Albanians**	**Greeks**
Number	29	29
Age (years)	30.97±9.02	34.14 ±9.23 (NS)
Sex (male/female)	21/8	21/8
Body weight (kg)	58.67±11.95	65.08±11.51
Donor age (years)	54.63±10.59	51.58±16.91
Total Protein (g/dl)	7.27±0.60	7.23±0.60
Serum albumin (g/dl)	4.47±0.53	4.41±0.43
Total cholesterol (mg/dl) Triglycerides (mg/dl)	174.53±37.77* 144.69±74.15	235.85±73.21* 184.57±105.90
Blood pressure		
Systolic (mmHg)	143.39±20.41	142.60±3.50
Diastolic	86.07±6.54	86.20±13.79

* P: 0.012.

and graft survival) as well as various clinical (weight, systolic and diastolic blood pressure), biochemical pa-rameters (serum creatinine, total protein, albumin, total cholesterol, triglycrides, 24 hour proteinuria) and steroid and cyclosporine A dose changes during time.

All patients received triple or quadruple induction therapy (methylpre dnisolon, azathioprine/mycopheno-late mofetil and Cyclosporine A). The antibodies used as induction therapy were ATG, Basiliximab or Dacli-zumab.

Renal biopsy was done when there was delayed graft function, a plateau of falling serum creatinine during the immediate posttransplant period or a raise of serum cre-atinine > 25% from the steady sate condition. BMI before and at the end of the first year was calculated.

Cumulative survival was estimated with the prod-uct limit method (Kaplan Meier) and the differences between groups were estimated by the methods Log Rank, Breslow and Tarone – Ware. Repeated measures analysis was used for serial sample measurements dur-ing time and Fisher's exact test for differences in cat-egorical data. Unpaired t test (two tailed) was used for estimation of differences of the means between groups. Statistical significance was considered to be when p ≤ 0.05.
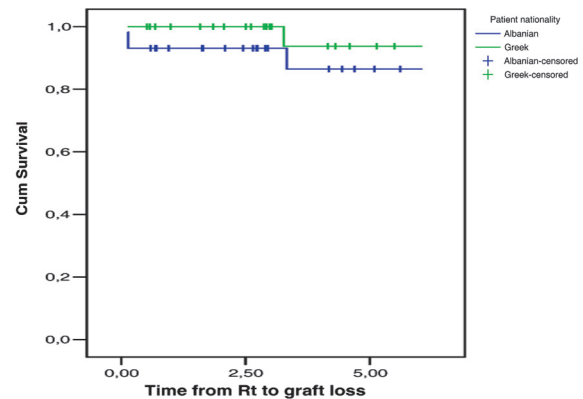

Figure 1: Five year graft survival of Greek (green line) and Albanian (blue line) patients.

Results

There was no difference in patient and graft survival (Figure 1 and 2 respectively). Graft survival (G/A) at 1 and 5 years was 100% / 93.10% and 93.75% / 86.45% respectively (p: NS). Patient survival (G/A) at 1 and 5 years was 100% / 93.1% and 100% /93.1% respectively (p: NS). There were two deaths. An Albanian woman died because of infection and an Albanian man because of unknown reason. Three grafts were lost in the group A (two because of death and one because of chronic al-lograft nephropathy) and two in the group G (because of allograft nephropathy).

The group of Greek patients (G) presented higher body weight compared to group of Albanian patients dur-ing the 1st posttransplant year (Table 2) but the estimated BMI was not different. There was no difference in blood pressure (systolic – Table 3 and diastolic - Table 4), se-rum creatinine (Table 5), total serum protein and serum albumin (Tables 6 and 7, respectively). The group of G presented significantly higher levels of total cholesterol before transplantation (Table 1) and the difference re-mained significant during the 1st year after transplanta-tion in spite the tendency for the cholesterol levels to fall
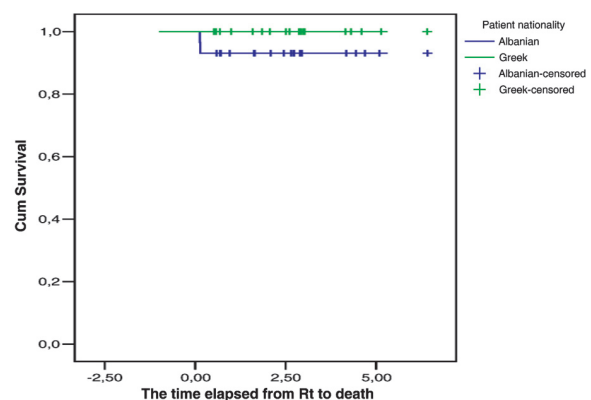
Figure 2: Five year patient survival (Greeks green line, Al-banians blue line).

Table 2: Greek and Albanian patient body weight (kg) during the first post-transplant year

Body weight	Greek pts	Albanian pts
7th po day	65.50 ±10.48	56.71±11.81
15th po day	63.79±11.25	56.41±10.76
30th po day	63.23±11.56	55.35±10.68
3rd po month	64.17±11.56	57.53±10.17
6th po month	64.59±10.11	58.87±9.97
12th po month	65.72±10.4	59.31±10.34

po: postoperative, p: 0.044 (repeated measures analysis).

Table 3: Greek and Albanian patient systolic blood pressure (mmHg) during the first post-transplant year

Systolic BP	Greek pts	Albanian pts
7th po day	161.35 ±23.17	150.88± 14.66
15th po day	138.70 ±28.26	144.12± 17.29
1st po month	134.96 ±14.17	136.53 ±16.59
3rd po month	134.83 ±13.27	130.00± 9.52
6th po month	134.22 ±10.72	125.59 ±12.885
12th po month	132.61± 11.26	129.94±17.05

p: NS.

Table 4: Greek and Albanian patient diastolic blood pressure (mmHg) during the first post-transplant year

Diast BP	Greek pts	Albanian pts
7th po day	95.43±11.53	92.00±8.55
15th po day	89.13±11.74	90.35±9.72
1st po month	84.57±11.23	93.18±10.30
3rd po month	87.43±9.86	85.59±8.07
6th po month	84.96±6.33	83.82±12.18
12th pomonth	86.52± 9.22	82.65±8.12

p: NS.

Table 5: Greek and Albanian patient serum creatinine (mg/dl) during the first post-transplant year

SCr	Greek pts	Albanian pts
7th po day	2.33±2.05	1.69±1.05
15th po day	1.82±1.88	1.55±0.79
1st po month	1.39± 0.45	1.57±0.95
3rd po month	1.35±0.42	1.36±0.38
6th po month	1.34±0.43	1.37±0.30
12th po month	1.46± 0.44	1.39 ±0.32

p: NS.

Table 6: Greek and Albanian patient serum total protein (g/dl) during the first post-transplant year

Total protein	Greek pts	Albanian pts
1st po month	7.04± 0.56	7.04± 0.62
3rd po month	7.10 ±0.53	7.29± 0.54
6th po month	7.20± 0.55	7.26 ±0.42
12th po month	7.06± 0.56	7.44 ±0.50

p: NS.

Table 7: Greek and Albanian patient serum albumin (g/dl) during the first post-transplant year

Serum albumin	Albanian pts	Greek pts
1st po month	4.24± 0.54	4.50± 0.42
3rd po month	4.46±0.34	4.49± 0.45
6th po month	4.65±0.36	4.55±0.38
12th po month	4.68±0.31	4.53±0.45

p: NS.

Table 8: Greek and Albanian patient serum total cholesterol levels (mg/dl) during the first post-transplant year

Total cholesterol	Greek pts	Albanian pts
1st po month	273.66±71.93	243.31± 40.15
3rd po month	281.85±52.16	250.31±42.96
6th po month	280.42±68.96	232.62±35.17
12th po month	258.47±69.83	228.50±43.52

p: 0.021 (repeated measures analysis).

in the end of the year (Table 8). There was no difference on triglyceride and HDL – cholesterol levels (Table 9 and 10).

The difference in medrol dose (Table 11) is due to the baseline dose which is the same for all patients irrelevant of body weight. The CsA dose (Table 12) did not present any difference and this is a clue against to the existence of metabolic difference of CsA between the two groups.

There was no difference in the 24hour proteinuria at the end of the year between the groups (G= 18 pts, A=20 pts). Four acute rejection episodes were recorded in the G (28 biopsies) and 8 in the A group (25 biopsies).

Discussion

Despite remarkable improvements in recent years race and social class continue to be powerful factors of

Table 9: Greek and Albanian patient serum triglycerides (mg/dl) during the first post-transplant year

Triglycerides	Greek pts	Albanians pts
1st po month	172.60±87.87	167.43±74.07
3rd po month	177.25±78.60	198.37±109.55
6th po month	160.50±98.10	190.06±76.58
12th po month	157.45±101,04	159.25±52.22

p: NS.

Table 10: Greek and Albanian patient serum HDL cholesterol (mg/dl) during the first post-transplant year

HDL cholesterol	Greek pts	Albanian pts
1st po month	62.53±23.75	62.27±20.78
3rd po month	55.15±17.99	47.45±11.36
6th po month	57.07±17.41	47.81±8.07
12th po month	54.03±16.83	47.90±7.56

p: NS.

Table 11: Medrol dose (mg/per kg body weight) during the 1st post-transplant year

Medrol	Greek pts	Albanian pts
Baseline	7.75±1.16	8.98±1.93
1st po month	0.25±0.10	0.29±0.08
3rd po month	0.18±0.04	0.19±0.03
6th po month	0.14±0.03	0.15± 0.03
12th po month	0.12±0.02	0.11±0.03

p: 0.05 (repeated measures analysis).

Table 12: CsA dose during the 1st post-transplant year

CsA mg/kg	Greek pts	Albanian pts
	mg/kgBW	mg/kgBW
Baseline	3.88±3.23	5.15±2.80
1st po month	5.35±2.10	5.27±1.37
3rd po month	3.76±1.41	5.27±1.37
6th po month	3.26±0.96	3.39±0.82
12th po month	3.32±1.98	2.81±0.57

p: NS

Table 13: Twenty four hour proteinuria (g), number of rejection episodes and BMI

	G	A
24/h proteinuria	0.107±0.190 (18)	0.119±0.188 (20)
(1st year)		
nare/nb	4 /28*	8/25 *
BMI before Rt	22.56±3.22	21.23± 3.43
BMI one year after Rt	23.13± 2.65	22.21±2.61

*p: NS (Fisher's exact test),
nare: nuber of acute regection episodes,
nb: number of biopsies.

access to health care and health status of minorities and low-income populations[5]. There is controversy on the influence of genetic and environmental factors on kidney transplantation outcome in minority groups. Curtis concludes that blacks have worse allograft survival for unknown reasons with most likely explanation the poor socioeconomic status without excluding different immunologic profile[2]. Recently Pallet's group in Paris analyzed 1092 patient kidney transplants and did not find difference in allograft survival between black and white patients[4].

In our study there was no difference in acute rejection episodes, proteinuria and serum creatinine levels. The lack of difference between Greek and Albanian patients regarding patient and graft survival points to absence of difference of immunologic and / or pharmacogenetic factors related to ethnicity.

The quality of data is always a concern because of the significant amount of missing and potentially erroneous information (misclassification bias). In particular, socio-

economic status is difficult to quantify and patients might be unwilling to give certain information (marital status, education). Misclassification bias is difficult to address in retrospective studies and is one of the shortcomings of the data registry analyses. As in other retrospective studies regarding ethnicity and economic status effect, the analysis of our study does not establish any difference in patient and graft survival. It is known that the Albanian immigrant income is lower than that of the Greek population. In spite of this we do not know the annual income of the particular transplanted patients. Also the statistics about the job and employment status of these people is changing during time. Over just a few years, through increased ability in the Greek language and a better understanding of employment possibilities, the Albanians in their sample tend to move out of the unskilled farm work and rapidly move into construction, small firm employment, technician's work and transport services[6]. The majority of Albanian immigrants are categorized as favorably "self selected" migrants who are inclined to be more ambitious, entrepreneurial, and aggressive than individuals choosing to remain in their home country[7]. If we accept that there is difference in the socioeconomic status of transplanted Albanian immigrants, it is counterbalanced by the policy of universal drug coverage and immunosuppression in Greek State and by their close family bonds.

It has been reported that non –compliance to medications leads to rejection and allograft failure in European countries[8]. Non – adherence might play a role in the difference between African – Americans and Caucasians. In our material, patient adherence to medical regimen was not studied.

The difference in cholesterol levels might be due to lower body weight of Albanian patients but the calculated BMI disclosed that there was no a real difference. Different dietetic attitudes and the higher steroid dose might be responsible for it as well as the possible difference in the socioeconomic status between the groups. The CsA dose did not present any difference. This fact combined with the higher MP dose raises questions about the higher number of rejections in A group and needs further investigation.

In conclusion patient and graft survival did not present difference between G and A group. A larger number of transplants and a longer period of follow up are possibly needed to allow us to draw firm conclusions about the behavior of Albanian patients.

References
1. Ojo AO, Hanson JA, Meier – Kriesche HU, et al. Survival in recipients of marginal cadaveric donor kidneys compared with other recipients and wait – listed transplant candidates. J Am Soc Nephrol 2001; 12: 589-597
2. Curtis JJ. Kidney transplantation. Racial and socioeconomic disparities. Am J Kidney Dis 1999;34:756-758
3. Rostand SG, Kirk KA, Rutsky EA, Pate BA. Racial differences in the incidence of treatment for end stage renal disease. N Engl J Med 1982; 306: 1276-1279

4. Pallet N, Thervet E, Alberti C, et al. Kidney transplant in black recipients. Are African Europeans different from African Americans? Am J Transplant 2005; 5: 2682-2687

5. Geiger HJ. Race and health care – an American dilemma? N Engl J Med 1996; 335: 815-816

6. Labrianidis L, Liberaki A. Albanian immigrants in Thessaloniki, Thessaloniki, Greece, Paratiritis, 2001

7. Chiswick BR. "Are immigrants favorably self selected : an eco-nomic analysis" in Brettell CB and Hollifield JF (eds): Migration theory: talking about disciplines, New York: Routledge, 2000; pp 61-77

8. De Geest S, Borgermans L, Gemoets H, et al. Incidence deter-minants and consequences of sub-clinical non-compliance with immunosuppressive therapy in renal transplant recipients. Trans-plantation 1995; 59; 34-347