Original Articles

The Impact of New Immigrants from the Former Soviet Union on the Severity of Coronary Angiographic Findings in a Public Hospital in Israel

Edward G. Abinader MD FRCPI, Dawod S. Sharif MD, Leonid Kharash MD and Kira Mamedov MD

Coronary Care Unit and Catheter Laboratory, Bnai Zion Medical Center and Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

Abstract

Background: The arrival of 610,000 new immigrants to Israel from the former Soviet republics accounted for 58% of the population growth in the early 1990s.

Objective: To compare the coronary angiographic findings and risk factors between the new immigrants and local Jewish and Arab patients in this era of cost containment.

Methods and Results: A total of 550 consecutive patients — 314 Jews, 95 new immigrants and 141 Arabs — were catheterized and analyzed during a 5 month period in 1995. Of this group 403 were males (73%). The mean age was 63.6 ± 10.2 years among new immigrants, 62.4 ± 9.4 among Jews, and 55.1 ± 10.9 among Arabs ($P < 0.05$). Immigrants, including those under age 60, had the highest prevalence of multivessel disease (88.7%). Arabs had a high prevalence of single vessel disease (34.6%) and a low prevalence of multivessel (65.4%) and left main coronary disease (5.6%). Age, gender, risk factors and ethnic origin in descending order were determinants of the extent of coronary angiographic disease as revealed by multiple regression analysis.

Conclusion: New immigrants had the most extensive angiographic coronary involvement, while Arab patients were younger and had less severe coronary artery disease. More intensive risk factor modification may have a major impact on disease progression particularly in the new immigrant subgroup.

IMAJ 2000;2:274–277

From 1990 to 1994, 610,000 new immigrants arrived in Israel, the majority from the former Soviet republics, accounting for 58% of the population growth during that period [1]. In this era of cost containment, we wished to assess the influence of certain factors, including the impact of new immigrants compared to the local Jewish and Arab population, as well as patterns of adherence to medical advice, on the severity of coronary angiographic disease.

Large multicenter clinical trials [2,3] have demonstrated dramatic reductions in cardiovascular morbidity and mortality through modification of risk factors. Did the influx of new immigrants from the former Soviet Union, who have a different risk factor profile, have any bearing on the severity of coronary artery disease in our catheterized population? We examined the various characteristics of all catheterized patients during 5 months in 1995 following the large influx of 37,100 new immigrants to Haifa, whose total population was 265,000.

Methods

During a 5 month period in 1995 we performed diagnostic coronary angiography in 550 consecutive patients at the Bnai Zion Medical Center in Haifa. Patients were referred for coronary angiography by our coronary care unit, internal medical departments, outpatient clinics and cardiology clinics from the Haifa and Galilee districts. Coronary artery lesions were judged significant if there was a decrease in luminal diameter of >50% in the left main coronary artery or >70% in the other major coronary arteries. Intergroup comparisons were performed for prevalence of significant LMCA, triple vessel disease, double vessel disease with or without involvement of left anterior descending artery, and single vessel disease, with reference to the stenosed vessel. Risk factors, and site and severity of coronary lesions were compared in the new immigrants versus the Jewish and Arab Israeli patients, taking into account their age, gender and left ventricular function. Drug intake and multiple risk factors such as cigarette smoking, hypertension, hyperlipidemia, diabetes mellitus and obesity were screened on admission.

LMCA = left main coronary artery

Table 1. Patients' characteristics and indications for catheterization

	N (%)	Males	Age (yr)	Stable AP	UAP	S\P MI	Chest pain	Other
New immigrants	132(24)	102(77)	63.6±10.2	82(62)	16(12)	66(50)	8(6)	8(6)
Veteran Jews	276(50.2)	204(74)	62.4±9.4	163(59)	14(5)	119(43)	25(9)	41(15)
Arabs	142(25.8)	98(69)	55.1±6.9	84(59)	10(7)	52(37)	14(10)	10(7)
Total	550(100)	402(73)	61±9	330(60)	38(7)	236(43)	49(9)	60(11)

AP = angina pectoris, UAP = unstable angina pectoris, MI = myocardial infarction

Statistical analysis

Values were expressed as mean±standard deviation. ANOVA statistical analysis was utilized with $P<0.05$ considered as significant. Fisher's exact test was performed when applicable. Multiple linear regression analysis was performed, using extent of coronary artery disease (single, double, and triple vessel disease) as the dependent variable, and age, gender, risk factors and ethnic origin as the independent variables.

Results

Table 1 shows the characteristics and indications for catheterization in 550 consecutive patients who underwent diagnostic coronary angiography during 5 months in 1995. The majority of Arab patients with coronary artery disease were under 60 years old (54%), while most of the new immigrants (70%) and Jewish patients (66%) were over age 60 ($P<0.05$).

The distribution of coronary artery disease at coronary angiography in the different ethnic groups is shown in Table 2. New immigrants had the highest prevalence of multivessel disease (88.7%), while Arab patients had the highest prevalence of single vessel disease.

Coronary angiographic findings in various age and patient subgroups are depicted in Table 3. New immigrants revealed a predominance of triple vessel disease even in young age subgroups, however after age 60 years the rate was similar to that in the Arab subgroup. The prevalence of LMCA disease was 12.6% in the catheterized population, 13.7% males and 9.6% females, occurring in 78% of

Table 2. Coronary angiographic findings

	Single vessel disease (%)	Double vessel disease (%)	Triple vessel disease (%)
New immigrants (n=132)	11.2	39.3	49.4
Veteran Jews (n=276)	23.7	30.7	45.6
Arabs (n=142)	34.6	24.8	40.6
Statistics			
P NI vs. VJ	0.0051	0.08	0.1
P NI vs. AR	0.0001	0.0198	0.1
P VJ vs. AR	0.0199	0.1	0.1

AR = Arabs, NI = new immigrants, VJ = veteran Jewish patients.
P = statistical difference between the groups.

males and 92% of females over the age of 60 years. The lowest prevalence of LMCA disease was among Arabs, 5.6% compared to 15.5% among Jews ($P<0.005$).

Table 4 shows the distribution of single vessel disease in the various ethnic groups. LAD was the predominant vessel involved, particularly in the Arab subgroup. Double vessel disease, with involvement of LAD, was similar in all subgroups, 54% of Arabs, 55% of veteran Jewish patients and 61% of new immigrants, except in new immigrant males in whom it reached 81% ($P<0.001$). Angiographic left ventricular ejection fraction was above 50% in 62.2% of the patients. Moderate reduction (30–39%) and severe reduction (<30%) in LVEF were found in 13.2% and 9.6% of patients respectively. The small number of patients in the groups with reduced ejection fraction did not allow meaningful statistical analysis according to ethnic origin. Table 5 illustrates the fre-

Table 3. Prevalence (%) of diseased coronary arteries in various age and patient groups

	<49 yr (n=64)			50-59 yr (n=90)			60-69 yr (n=155)			>70 yr (n=110)		
No. of diseased vessels	1	2	3	1	2	3	1	2	3	1	2	3
New immigrants	20	30	50	11.1	27.8	61.1	8.6	54.3	37.1	14.8	29.6	55.6
Veteran Jews	31	33.3	35.7	22.5	45	32.5	19.5	25.3	55.2	21.7	23.2	55.1
Arabs	31.8	36.4	31.8	28.1	31.3	40.6	48.5	15.2	36.4	21.4	14.3	64.3
Statistics												
NI/VJ	0.05	NS	0.04	NS	0.04	0.025	NS	0.001	0.03	NS	NS	NS
AR/NI	0.05	NS	0.03	0.04	NS	0.05	0.001	0.001	NS	NS	0.04	NS
VJ/AR	NS	NS	NS	NS	0.05	Ns	0.001	NS	0.03	NS	NS	NS

NI/VJ, AR/NI and VI/AR comparisons between the various groups with the respective *P* values. NS = not significant

LAD = left anterior descending artery
LVEF = left ventricular ejection fraction

Table 4. Prevalence (%) of coronary artery involvement in single vessel disease

	Arabs (n=49)	New immigrants (n=15)	Veteran Jews (n=65)
Left anterior descending artery	62.4*	42.8	45.9
Left circumflex artery	20.6	28.6	8.2**
Right coronary artery	17.2	28.6	45.9**

* $P<0.05$ for Arabs vs. new immigrants and Arabs vs. veteran Jews.
** $P<0.05$ for veteran Jews vs. Arabs and veteran Jews vs. new immigrants.

quency of the various risk factors in the patient population. Cigarette smoking was most common among Arab males, reaching 66% ($P<0.01$). Univariate and multivariate analysis revealed that the major determinants of the severity of coronary artery disease in descending order were: age, gender, risk factors and ethnic origin.

Medications that patients had taken included: aspirin in 63%, nitrates in 51%, calcium blockers in 48%, beta-blockers in 44% and angiotensin-converting enzyme inhibitors in 32%. Only 12% of hyperlipidemic patients were actively treated.

Discussion

New immigrants from the former Soviet republics constituted the most severely affected patients, with the largest number of significant triple vessel disease in all age groups including those under age 50. In contrast, Arab patients had less severe coronary disease as evidenced by the higher prevalence of single vessel disease, and a decreased prevalence of left main and multivessel coronary artery disease.

Multiple regression analysis revealed that age was the major predictor of the severity of coronary disease in this study. The structure of Israeli Arab society is young, thus 40% of the Arab population in Israel are under the age of 14, and only 3% are over age 65 compared to 11% of the Jewish population [1]. This may account for the younger age of the Arab study population, which in turn may explain their less severe coronary disease. The major role

of age is highlighted by a similar high prevalence of severe coronary disease in all three subgroups over 70 years of age. Since the age of immigrant and veteran Jewish patients was similar, it cannot account for the difference in the severity of coronary disease in those two subgroups. Gender was the second powerful predictor of the severity of the disease, and, being similar in the immigrant and veteran Jewish population, also cannot account for the difference in the severity of the disease. Since the worst coronary risk profile was observed in the immigrant population, it is the major determinant of the severity of the disease in this group. Moreover, risk factors were especially poorly controlled in new immigrants, as was observed by others [4]. Although the risk per patient was lower among Arab patients, a recent study from Israel showed that 37% of patients admitted with acute myocardial infarction were cigarette smokers, and they were 10 years younger than non-smokers [5]. This may be an additional explanation for the younger age of our Arab male patients, 66.3% of them smokers, which was significantly higher than in the other two groups ($P<0.01$).

The influx into Haifa of new Russian immigrants with their severe atherosclerotic burden, coupled with the aging society in that city, has led to a definite increase in the incidence and severity of coronary artery disease in the city. According to the Central Bureau of Statistics for 1995, 17.7% of Haifa citizens were over age 65 compared with only 8% in Jerusalem. Furthermore, less than 25% of Haifa residents were under 18 compared to 40% in Jerusalem. In contrast to other immigrant groups — such as Yemenites to Israel, Japanese to Hawaii and California [6], and Indians to west London [7] — in whom increases in risk factors occurred in their new environment, the immigrants from the former Soviet republics to Israel demonstrate the reverse process. In light of the findings of our present study and considering the reported reduction in life expectancy in Russia from 1990 through 1996, it remains to be seen whether their new environment would have a salutary effect on their risk profile, coronary angiographic findings, and life expectancy. It is intended to reassess the coronary risk profile and angiographic findings in the future with particular reference to the immigrant population.

Table 5. Prevalence (%) of risk factors of coronary artery disease in the study groups

	Diabetes	Hypertension	Hyperlipidemia	Smoking	Family history	Obesity	Risk factors/ patient
Arabs	13	33	24	39	21	23	1.5
New immigrants	26	45	44	38	16	28	2.0
Veteran Jews	16	47	45	23	18	18	1.7
Statistics							
P NI/AR	0.01	0.05	0.05	NS	NS	NS	0.05
P NI/VJ	0.05	NS	NS	0.05	NS	0.05	0.05
P AR/VJ	NS	0.05	0.05	0.05	NS	NS	0.05

AR = Arab patients, NI = new immigrants, VJ = veteran Jewish patients.

References

1. Health in Israel, Ministry of Health monthly bulletin of statistics. January 1996.
2. Multiple Risk Factor Intervention Trial Research Group. Multiple risk factor intervention trial: risk factor changes and mortality results. *JAMA* 1982;248:1465–77.
3. Pederson TR, Kjekshus J, Berg K, Haybfelt T, Falgeman D, Thorgeirsson G, Pyorala K, Miettinen T, Wilhemsen L, Olsson AG, Wedel H. Randomized trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S). *Lancet* 1994;344:1383–9.
4. Ben-Noon L. Medications for hypertension and coronary artery disease in immigrants from previous Soviet republics. *Harefuah* 1995;129:392–4 (Hebrew).
5. Gottlieb S, Boyko V, Zahger D, Balkin J, Hod H, Pelled B, Stern S, Behar S. Smoking and prognosis after acute myocardial infarction in the thrombolytic era (Israeli Thrombolytic National Survey). *J Am Col Cardiol* 1996;28:1506–13.
6. Robertson TL, Kato H, Rhoads GG, Kagan A, Marmot M, Syme SL, Gordon T, Worth RM, Belsky JL, Dock DS, Miyanishi M, Kawamoto S. Epidemiological studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii, and California: incidence of myocardial infarction and death from coronary heart disease. *Am J Cardiol* 1977;39:239–49.
7. Bhatnagar D, Anand IS, Durrington PN, Patel DJ, Wander GS, Mackness MI, Creed F, Tomenson B, Chandrashekha Y, Winterbotham M, Britt RP, Keil JE, Sutton GC. Coronary risk factors in people from the Indian subcontinent living in West London and their siblings in India. *Lancet* 1995;354:405–9.

Correspondence: Dr. E. G. Abinader, Heart Institute and Coronary Care Unit, Bnai Zion Medical Center, 47 Golomb St., Haifa 31048, Israel. Tel: (972-4) 835 9387; Fax: (972-4) 837 2991; email: abinader@netvision.net.il.