

# Middle East Society for Organ Transplantation (MESOT) Transplant Registry

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During the seventies, sporadic renal transplants were performed in few MESOT-region countries, mainly Turkey, Iran, Egypt, and Lebanon. Since the introduction of cyclosporine in the early eighties, transplantation has become the preferred therapeutic modality for end-stage renal failure. In 1986, the Islamic theologians (Al Aloma) issued what became known as the Amman declaration, in which they accepted brain death and retrieval and transplantation of organs from living and cadaveric donors. Based on this and similar declarations, all Middle Eastern countries except Egypt passed laws that allow cadaveric transplantation and regulate live donations. Iran, Turkey, Saudi Arabia, Kuwait, Tunisia, Jordan, and Lebanon all have current active cadaveric programs and perform liver, heart, pancreas, and lung transplants. More than 5088 renal transplants/year are performed in the region with Iran leading with 1600. The cumulative number of renal transplant patients is now nearly 60,000. With a 2003 population of 600,682,175, the rate/million for renal transplantation in the MESOT region is a mere 9/million. Rates of renal transplantation range from 31/million in some countries to 0 in others. The major obstacle in establishing an accurate number of transplants

is "tourist transplantation," in which the same transplanted patients are registered in different countries. Although cadaveric programs have been active for more than 10 years, live-related and nonrelated transplants account for nearly 85% of the total transplants. The data presented were collected from MESOT representatives in the region and from publications. For proper compilation of the registry, a format is being proposed that will be presented at the Congress for review and adaptation. Even with the limited resources in the region, immunosuppressive drugs for induction and maintenance therapy are available and are used. Costs for transplantation and immunosuppressive therapy are either totally or heavily supported by governmental agencies.

**Key words:** *MESOT, Kidney, Liver, Transplantation, Registry*

The general assembly of the Middle East Society of Organ Transplantation (MESOT) established the registry and appointed Marwan Masri to be its head in 2002. The initial task was to gather and tabulate data on transplant activity in the region.

Transplantation in the MESOT region began as early as 1969, with a heart transplant in Turkey [1]. During the seventies, sporadic renal transplants were performed in few of the MESOT-region countries including Lebanon, Turkey, Jordan, Egypt, Pakistan, Kuwait, Iran, and Saudi Arabia. The rest of the countries in the region followed in 1980. Currently, kidney transplantation is the preferred therapy for end-stage renal failure in nearly all MESOT-region countries, with Bahrain, United Arab Emirates (UAE), Qatar, and Yemen as exceptions. In 1986, the Islamic theologians (Al Aloma) issued what became known as the Amman declaration, in which they clearly accepted brain death and

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the retrieval and transplantation of organs from living and cadaveric donors. Based on this declaration and similar ones from Al Ahzar and the grand muftis of Egypt, Saudi Arabia, Iran, and Turkey, all countries in the Middle East (with the exception of Egypt, Pakistan, and Iraq) passed laws that allowed cadaveric transplantation and regulated live donations. Several countries also established laws and guidelines for transplant centers. These declarations and laws have been instrumental in expanding the transplant programs for liver, heart, pancreas, and lung transplantation in countries that have active cadaveric programs such as Iran, Turkey, Saudi Arabia, Kuwait, Tunisia, Jordan, and Lebanon.

Below is a summary of the transplant activities in each country as reported by the country representative in the MESOT Council and personal communication.

### Kingdom of Saudi Arabia (KSA)

The program in KSA began in the early 1980s. The program is currently coordinated by a semigovernmental organization, The Saudi Center of Organ Transplantation (SCOT). Between 1997 and 2003, there were 524 cadaveric and 1587 living-related renal transplants performed in the Kingdom. In the same period, there were 2073 living-nonrelated transplants performed outside the Kingdom. In 2003, there were 228 living-related, 71 cadaveric, and 723 living-nonrelated kidney transplants (Table 1). The living-nonrelated kidney transplants were all performed outside the Kingdom [2]. There is an active transplant program that has performed 321 liver, 97 heart, and 540 bone marrow transplants (Table 2).

### Tunisia

Through the end of 2003, 155 cadaveric and 350 living-related kidney transplants were performed in Tunisia [3]. Only 30 kidney transplants were performed outside the country (Table 1). There is also a modest multiorgan transplant program that has performed 16 liver, 14 heart, and 196 bone marrow transplants (Table 2).

### Turkey

Since 1975, there have been 6257 kidney transplants in Turkey [1]. The kidney transplant program uses mainly living-related and cadaveric donors. In 2003, there were 605 kidney transplants, all of which were performed inside the country (Table 1). Turkey

also has the most active liver and heart transplant program in the region, with a total of 703 liver transplantations having been performed since 1988, 121 heart transplants since 1969, and 1264 bone marrow transplants since 1978 (Table 2).

### Iran

The Iranian transplant program is the most active in the MESOT region. Nearly 17,000 kidney transplants have been performed in Iran [4], 493 of which were cadaveric (Table 1). The government-controlled program uses mainly nonrelated living donors. With ratification by the Iranian Parliament of the Cadaver Organ Donation Act, the transplant program was expanded to other organs. By the end of September 2004, Iran had already performed 131 liver, 78 heart, 7 lung, and 2 heart-lung transplants.

**Table 1.** Rate of renal transplants performed in each MESOT country during 2003

Country	Population	Total No. of transplants	No./year 2003	Per million/year
Algeria	32,199,857	1200	42	1.3
Bahrain	676,461	280	12	17.7
Cyprus	773,250	520	22	28
Egypt	76,027,273	7000	380	5
Iran	68,753,499	16,810	1553	23
Iraq	25,257,859	3500	312	12.3
Jordan	5,450,418	1000	56	10.3
KSA*	25,607,367	6131	410	16
Kuwait	2,129,005	1146	97	45.6
Lebanon	3,774,670	941	70	19
Libya	5,596,976	680	45	8
Morocco	32,369,016	480	27	0.84
Oman	2,871,129	230	19	6.6
Pakistan	160,132,577	9000	2050	13
Qatar	779,559	230	14	18
Sudan	39,074,168	1150	50	1.3
Syria	17,970,525	630	102	6
Tunisia	9,977,049	535	29	3
Turkey	69,018,657	6257	554	8
UAE**	2,499,215	580	23	9.2
Yemen	19,743,645	288	19	1

\* Kingdom of Saudi Arabia \*\* United Arab Emirates

**Table 2.** Number of liver, heart, and bone marrow transplants in the MESOT countries where the program is available

Country	Liver	Heart	Bone marrow
Egypt	200	5	1700
Iran	131	78	3120
Kingdom of Saudi Arabia	321	97	540
Lebanon	16	22	142
Oman	12	6	52
Pakistan	50	22	550
Tunisia	16	14	196
Turkey	703	121	1246
<b>Total</b>	<b>1449</b>	<b>365</b>	<b>7546</b>

### **Egypt**

Although Egypt has an active living-donor transplant program, its Parliament has yet to ratify the Cadaveric Donation Act. Since 1976, there have been nearly 7000 kidney transplants, most of which were performed inside the country from both living-related and nonrelated donors [5]. In 2003, there were 380 kidney transplants performed in Egypt. Beside kidneys, Egypt has an active living-donor liver transplant program with more than 200 transplants having been performed through November 2004. Moreover, Egypt has an active bone marrow program, having performed 1700 transplants until now.

### **Kuwait**

The kidney transplant program in Kuwait is very active. Since 1979, there have been 1146 kidney transplants (Table 1), of which 866 were from living donors, 180 were from local cadaveric donors, and 100 were from foreign cadaveric donors [6]. Based on the number of transplants per year/million, Kuwait boasts the highest rate in the MESOT region with 37 transplants/million each year.

### **Lebanon**

Transplantation in Lebanon started in 1972. Since then, 941 kidney transplants (Table 1) have been performed [7]. Of the 740 that were performed inside the country, 100 were from cadaveric donors. The rest were performed outside the country. The Lebanese government has established rules governing donation from cadaveric and living donors. Only 16 liver, 22 heart, 1 lung, 1 pancreas, and 140 bone marrow transplants have been performed in Lebanon (Table 2).

### **Pakistan**

Pakistan is the most populous country in the MESOT region, but until now, has not had an approved cadaveric donor program [8]. The kidney transplant program is quite active, with more than 9000 transplants having been performed since its inception, with nearly 2000 transplants being performed per year (Table 1). Only 50 liver, 22 heart and liver, and 550 bone marrow transplants have been performed in the country.

### **Oman**

There have been 900 kidney transplants in Oman, many of which were performed outside the country [9]. Beside the kidney program, there have been 52

bone marrow, 12 liver, and 5 heart transplants. All the liver and heart transplants were performed outside the country.

### **Bahrain, United Arab Emirates, Yemen, and Qatar**

There is no real transplant program in Bahrain, Qatar, Yemen, and the UAE. Sporadic kidney transplants are performed every year locally. However, most of the transplants are performed outside the countries. In 2003, there were 12, 14, 19, and 23 kidney transplants in Bahrain, Qatar, Yemen, and the UAE respectively. None of the UAE transplants were performed in the country (Table 1).

### **Syria and Jordan**

In Jordan, the kidney transplant program began in the early 1980s. Jordan was the second member state after Turkey to establish a cardiac transplant program. Jordan also serves as a center for transplantation for Yemen and Libya. Syria started its transplant program early, with a dedicated living-related donor program. In the past 2 years, the program has expanded to cover living-nonrelated as well as cadaveric kidney transplants. In 2003, there were 102 and 56 renal transplants in Syria and Jordan respectively (Table 1).

### **Libya, Algeria, and Morocco**

In Libya, Algeria, and Morocco, the transplant program is geared toward living-related donors with few transplants performed inside the country. In 2003, there were 42, 45, and 27 renal transplants performed in Libya, Algeria, and Morocco respectively. Most transplants are performed outside the countries.

There have been more than 5088 renal transplants performed in the MESOT region every year, with Pakistan and Iran leading with 2025 and 1600 kidney transplants per year respectively. The cumulative number of renal transplant patients is now approaching 60,000. With a population of 600,682,175 (for 2003), the rate/million for renal transplants in the MESOT region is a mere 9 transplants/million. The rates of renal transplantations range from 37 transplants per million in some countries to 0 per million in others countries. The major obstacle in establishing an accurate number of transplants is the "tourist transplantation" factor, where the same transplanted patients are registered in different countries. Although the cadaveric programs have been active for more than 10 years,

until now, living-related and living-nonrelated transplants account for nearly 85% of the total transplants.

In all the MESOT-region countries with the exception of Pakistan, Egypt, and Iraq, living-nonrelated programs are regulated by the government to minimize commercialism. No organ donation is accepted except for recipients of the same nationality. Moreover, the transplants are supported by the government (as in Iran) and are only performed in government-recognized centers or university hospitals.

The immunosuppressive drugs, anti-lymphocyte globulins (ALG), anti-thymocyte globulin (ATG), anti-interleukin 2 receptor (IL-2R), and steroids for induction therapy are available and being used in all the MESOT-region countries. Similarly, cyclosporine, tacrolimus, mycophenolate mofetil, and sirolimus are also available and are being used, with cyclosporine being the backbone and the most-preferred immunosuppressive agent. There is an active program to manufacture generic forms of both cyclosporine and mycophenolate mofetil in several MESOT countries.

Pretransplant testing for tissue typing, cross-matching, and panel reactive antibodies is an integral part at all transplant programs in MESOT-region countries. Blood level monitoring of cyclosporine and tacrolimus levels is being performed using the automated systems. Blood level monitoring of mycophenolate mofetil and sirolimus is restricted to

only few countries.

The data presented here were collected from MESOT representatives in the region for Turkey, Pakistan, Lebanon, Kuwait, Kingdom of Saudi Arabia, Oman, Tunisia, Iran, Egypt, and Yemen. The data for Syria, Jordan, UAE, Qatar, Bahrain, Algeria, Morocco, and Libya were collected via personal communications.

For proper compiling of the registry, a computerized format has been proposed and will be presented at the Congress for review and adaptation. Importantly, even with the limited resources in the region, immunosuppressive drugs for induction and maintenance therapy are available and are being used. The cost of transplantation and immunosuppressive therapy is being either totally or heavily supported by governmental agencies.

## References

1. Karakayali H, Haberal M, The History And Activities Of Transplantation In Turkey. *Transplant Proc.* (in press)
2. Data obtained from the Saudi Center for Organ Transplantation (SCOT)
3. Data obtained from the Tunisian Society of Nephrology
4. Data obtained from the Iranian Society of Nephrology
5. Data obtained from the Egyptian Society of Nephrology
6. Data obtained from Hamad Al-Essa Organ Transplantation Center
7. Data obtained from the Lebanese National Organization for Organ Donation and Transplantation (NOODT)
8. Data obtained from the Sindh Institute of Urology and Transplantation (SIUT)
9. Data obtained from the Omani Society of Nephrology