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Kidney Transplantation from Brain Dead Donors: Why and Where Do We Stand?

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Abstract

Living organ donation is the most widely practiced type of donation in the Middle East and includes kidney and partial liver. It is predominantly genetically related, however, non-genetically related and commercial living organ donation do exist. Other sources of organ donation include organs obtained from a donor after brain stem death (BD) also called (cadaveric heart beating donors), or donation after cardiac death (DCD) previously known as non – heart beating donation.

The objectives of this paper are to explain the rationale of using organs from BD donors, highlight the concept of BD, show legal, religious and ethical related issues and demonstrate the international experience and status of BD organ (kidney) transplantation in Iraq.

Introduction

Chronic kidney disease (CKD) is a common and costly health problem in the Middle East. Hemodialysis (HD) is still the major modality of renal replacement therapy (RRT) in the Middle East [(1)]. In Iraq HD is almost the only type of chronic dialysis. There are no data available on adequacy of HD in our country. The mean duration of Iraqi patients on HD in one study was shown to be about 26 months, while it is 82 months in Jordan study [(2)], whether this is due to an excess mortality among our CKD patients, loss of follow up due to inadequate clinical reporting system, or other factors yet to be determined.

The ideal treatment for end-stage renal disease (ESRD) is kidney transplantation (KT). However, the considerable shortage of donor organs and the increasing number of patients with ESRD on KT waiting lists often have resulted in unacceptably long waiting times for an appropriate organ allograft [(3)]. Other sources of organ donation include organs obtained from a donor after brain stem death (BD) also called (cadaveric heart beating donors) after BD criteria were defined and adopted in 1968, or donation after cardiac death (DCD) previously known as non – heart beating donation [(4,5)] or even ABO – incompatible living donor kidney transplantation [(3)]. Unfortunately paid living – unrelated (commercial) kidney transplantation or sometimes called (transplantation tourism) does exist and it is not only controversial for ethical aspects, but has been reported to result in serious complications in the postoperative period that cause high rates of morbidity and mortality, and it also carries the risk of a negative effect on local transplant programs [(6)].

Clinical issues of BD organ donation

Death can be considered in terms of medical, legal, ethical, philosophical, societal, cultural, and religious rationales. The medical definition of death is primarily a scientific issue based on

the best available evidence. There is growing consensus that there is a unifying medical concept of death; all human death is anatomically located to the brain. That is, human death involves the irreversible loss of the capacity for consciousness, combined with the irreversible loss of the capacity to breathe. These two essential capacities are found in the brain, particularly the brainstem, and represent the most basic manner in which the human organism can sense and interact with its environment [7, 8]. In other words BD is an irreversible status and can be considered as death.

Organs can be obtained from BD potential donors **providing that** the diagnosis of BD is achieved by a committee of expert clinical personnel, the patient is maintained on ventilator with intact circulation (usually in an intensive care unit ICU), there is/are no clinical contraindication(s) for organ retrieval such as HIV infection, current neoplastic disease …etc, and obtaining a consent for organ donation either from the deceased person (prior to his/her death for e.g. having a donor card), the family/ next of kin and sometimes the coroner and designated officer of the hospital [9] . The diagnosis of BD and the following steps required for organ retrieval and then transplantation are beyond the scope of this paper. An excellent BD organ donation program for e.g. that of United Network for Organ Sharing (UNOS) in USA allows single and multiple organ transplantation such as (Kidney – Pancreas), (Kidney – Heart – Lung), (Kidney – Pancreas – Heart), …etc and more than one patient may benefit from a single BD donor [10].

Religious issues

In 1986, the Islamic theologians (Al Aloma) issued what became known as the Amman declaration, in which they clearly accepted BD and the retrieval and transplantation of organs from living and cadaveric donors. The main consideration for the Islamic scholars Fatwa is the belief that human life is sublime (expressed vividly in Surah Al Maeda i.e. Quranic Chapter entitled "the Feast": "Whoever saves one life, as if he saves all mankind".

بسم الله الرحمن الرحيم (ومن احياها فكانما احيا الناس جميعا) المائدة 32

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 [11, 12, 13]. The above Middle East Countries and others joined the Middle East Society for Organ Transplantation (**MESOT**).

Legal issues

In Iraq the legislation for organ (kidney) transplantation had been declared as follows [14]:

قانون عمليات زرع الاعضاء البشرية رقم (85) لسنة 1986

عنوان التشريع : قانون عمليات زرع الاعضاء البشرية رقم (85) لسنة 1986

التصنيف: قانون عراقي / رقم التشريع: 85 / سنة التشريع: 27 – 8 – 1986

مادة 1: يجوز اجراء عمليات زرع الاعضاء ل لمرضى بهدف تحقيق مصلحة علاجية راجحة لهم تقتضيها المحافظة على حياتهم وذلك من قبل الطبيب الجراح الاختصاصي في المركز الطبي المخول رسميا الذي يعمل فيه شريطة ان يكون هذا المركز معدا لاجراء عمليات زرع الاعضاء البشرية .

مادة 2: يتم الحصول على الاعضاء لاجل اجراء عمليات الزرع من:

أ. من يتبرع بها او يوصي بها حال حياته شريطة ان يكون كامل الاهلية عند التبرع او الايصاء وباقرار كتابي.

ب. المصاب بموت الدماغ وحسب الادلة العلمية الحديثة المعمول بها التي تصدر بتعليمات في حالة موافقة احد اقاربه الكامل الاهلية من الدرجة الاولى او الدرجة الثانية وموافقة لجنة مشكلة من ثلاثة اطباء اختصاصيين بضمنهم طبيب اختصاص بالامراض العصبية على ان لا يكون من بينهم الطبيب المعالج ولا الطبيب الاختصاصي المنفذ للعملية.

مادة 3: يمنع بيع وشراء الاعضاء باي وسيلة ويمنع الطبيب الاختصاصي من اجراء العملية عند العلم بذلك.

مادة 4: يعاقب بالحبس مدة لا تزيد على سنة واحدة وبغرامة لا تزيد على الف دينار او باحدى هاتين العقوبتين كل من يخالف احكام هذا القانون .

International status

There are several nearby Middle East countries with active KT programs from living and BD donors. The International Registry in Organ

donation and Transplantation (IRODaT) website declares with regular update the current status of living and deceased (BD) organ transplantation all over the world including MESOT countries as shown in **figure (1)** [15]**.**

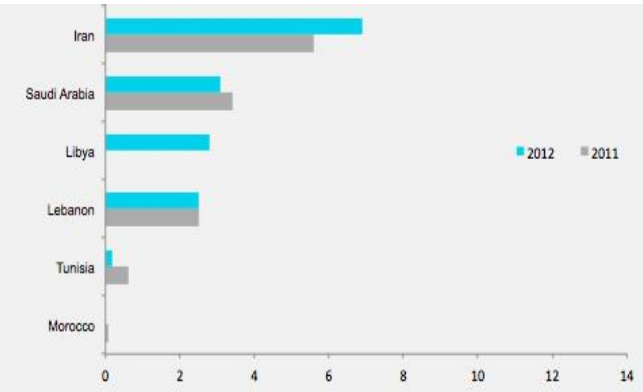

Fig. 1. Africa – Middle East Deceased Organ Donors per million population (PMP) 2012

In USA, the United Network for Organ Sharing (UNOS) which is a private, non-profit organization manages the nation's organ transplant system under contract with the federal government. UNOS developed an online database system, to collect, store, analyzes and publish all data related to the waiting list, organ matching, and transplants. Launched on October 25, 1999, this system contains data regarding every organ donation and transplant event occurring in the United States since 1986 [10].

Discussion

Iraq is one of the leading Middle East countries to start kidney transplantation (KT) program. The first living donor KT operation was carried out in 1973 by Professor Waleed Al Khial. The Medical City - Baghdad KT program started in 1985 by Professor Usama N. Rifat and colleagues. Since then KT was carried out in several governmental and private hospitals based on living related KT [16]. Although the legal and religious legislations for organ transplantation from BD donors are declared in our country in the 1980s, there is no yet a national BD organ donation program. This is related to several factors mainly the lack of awareness of BD organ donation merits from both health authorities and people in Iraq, lack of governmental economic funding for standardized ICU equipments and training the ICU staff to establish and maintain such program system, the series of social instability periods that Iraq passed through in the last decades due to wars and sanctions. In addition there is a lack of a standardized network system to collect and record all the relevant clinical data of kidney donation, transplantation and patients' follow up throughout the country.

Discussion of the national strategy to improve organ donation and transplantation in Iraq requires recruiting all the relevant authorities and professional staff who had experience of difficulties and limitations of organ transplantation to fix, re - write or modify the clinical and legal legislations concerning organ transplantation according to the current situation.

Regarding BD organ donation, it may be possible to think on the short term of cooperation of Iraqi Ministry of Health with certain regional / international authorities to bring cadeveric (BD) donor organs (Kidneys) to be used for transplantation and this requires legal and logistic infrastructure facilities to transport organs to the transplantation centre. This may go together with a national strategy on the long term to overcome lack of adequate public knowledge regarding organ transplantation from BD donors in Iraq by adequate and continuous public communication, education and organ donation campaigns for adults as well as educating high school and (medical and non medical) university students to promote a positive attitude towards organ donation among such young age group section of society. The latter can be implemented by teachers' education and highlighting the issue of organ failure and merits of life saving organ donation in the relevant teaching curriculum of students. The attitude of teachers [17] and high school students [18] toward organ donation was assessed in some countries as part of the above mentioned strategy. The same efforts should apply for upgrading our hospitals' ICUs and training medical and nursing staff working there

to maximize the clinical care for potential BD organ donors and achieve the best cooperation with the transplantation team including transplantation coordinators to avoid unnecessary delay of BD diagnosis and consequently improving the efficacy of organ donation program. Once people are aware of BD organ donation the next step to be implemented is the issuing of donor cards documenting the willingness of people wishing to donate organs when BD is established. Some Middle East countries published their experience in this respect [19].

The above steps have to go hand by hand with adequate support of transplantation surgeons by the ministry of health for updating their surgical experience and maintaining effective relevant research of patients' and allografts' survival [16] and postoperative complications as well as sharing the experience with the nearby MESOT recognized transplantation centers. The national plan to upgrade organ transplantation has to be carried out in a digital environment where all patients' clinical details are recorded in an intranet to facilitate retrieval and any necessary modification. This will clearly improve KT program from both living and BD donors and it will open the door for other organs transplantation in Iraq such as liver, cornea …etc to achieve the best results and saving more Iraqi patients suffering from end stage organ disease (ESOD). Finally it is of at most importance to thank all the Iraqi surgeons and other medical staff who worked hardly and continuously under all difficulties and limitations to initiate and maintain KT procedures which saved many Iraqi patients with ESOD

It is recommended to think of the regional and international experience of BD organ donation and open an intensive discussion to select the best plan which fits our local needs and our patient' safety.

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