THE IMPROVEMENT IN KIDNEY TRANSPLANT PROGRAM IN R. MACEDONIA – WHAT ARE THE CLUES?

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Abstract
Kidney transplantation (KTx) is the best treatment option in patients with chronic kidney disease (CKD). Health-economics data favour the KTx in comparison with any type of dialysis procedure, but the multidisciplinary approach and required high level of organisational infrastructure are frequent impediments for its availability in the majority of developing countries.

A living donor kidney transplant (LDKTx) programme has been developed in the Republic of Macedonia since 1977 but without a real continuum in the following years. There was a great success with 15 cadaveric kidneys transplanted (1987–1989) followed by an average of 13.5 KTx per year in the period 1996–2011.

Because of the scarce organ donation and transplant activities in the majority of Balkan countries the question remains what could be done in order to enable organ transplantation as the basic human right for the best treatment option in patients with CKD. In addition to the possible increase in the number of LDKTx, prerequisites for a deceased donor (DD) programme would be the creation of an official waiting list of candidates for DD transplantation, organizational and infrastructural networking and raising public awareness on the number of potential deceased donors through permanent media presentation.

Our involvement in the South-eastern Europe Health Network (SEEHN) initiative and the support from the newly created Regional Health Development Centre (RHDC) on Organ Donation and Transplant Medicine established in Croatia (Zagreb) was shown as successful for improvement of the KTx programme. At the very first professional meeting (27–28 May, 2011 in Skopje, Macedonia), the organ donation and transplantation needs of each country within the SEE geographical region were addressed and action plans for further steps on how to proceed were established. Hence, the number of professionals (including vascular surgeons) involved in KTx was increased along with the substantial increase in the reimbursement per transplant procedure at the Urology Department.

Nowadays, we are pleased to report 24 successfully performed LDKTx in 2012, and in 2013 for 7 months 28 transplantations, awaiting 40 KTx at the end of the year. Prospectively, we should initiate the deceased donor programme, even in order to sustain the already established high number of transplantation per month/year, since the potential for LDKTx may be exhausted. We also hope to be supportive for regional collaboration and transplantation of CKD patients from the neighbouring countries (Albania and Kosovo), and eventually to establish regional networking in deceased donor procurement, exchange and allocation practice.

Key words: kidney transplantation, living donor, deceased donation.
Introduction

Kidney transplantation is a universally accepted paradigm as best treatment option in patients with chronic kidney disease (CKD) [1]. Unfortunately, this is not an available procedure in the majority of developing countries. Primarily, it seems that the multidisciplinary approach and high level organisational infrastructure required for this procedure is lacking or cannot be properly established. On the other hand, health-economics data are in favour of kidney transplantation in comparison with any type of dialysis procedure [2]. However, there is an obvious disparity between the expenditure on public health as one of the major disincentives for poor transplant activity, the limited surgical and nursing workforce with the required expertise and the shortage of donated organs, with the call to deliver transplantation therapy to plenty of CKD people (World Kidney Day) who have a right to benefit. Nevertheless, although a really complex problem, there should be a solution involving the full range of societal, professional, governmental and political environments. Within the organizational infrastructure national and hospital transplant coordinators should be appointed, the donation activities should be permanently publicly promoted and the waiting list should be transparently composed. As for professionals, a continuous education of well-trained and competent procurement teams is to be considered essential for a successful deceased donation and transplantation programme. In order to increase the number of transplantations, improvement could initially be achieved through more frequent living-related transplant practice. Then, in the presence of a few committed surgical and transplant nephrological teams, and given that the transplant centre facilities and therapeutic armamentarium is adequately provided, a deceased donor transplant programme should be established.

The kidney transplant programme in R. Macedonia

The living donor kidney transplant (LDKTx) program in the Republic of Macedonia was initiated in 1977 but without a real continuum in the following years. Then, the education of transplant professional abroad (1985–87) was shown as a successful step for improvement and 15 cadaveric kidneys were transplanted in 1987–1989 while another 7 were allocated to the other centres of former Yugoslavia. This successful period may be explained by the exceptional work of a dedicated procurement personnel – neurosurgeon, complementary funeral expenses covered by the University Hospital and in general, the enthusiasm of the whole transplant team involved as achievements in our country were showing their competence in the field. However, there was no established organisational infrastructure and it could not have continued for a longer period.

In the period 1996–2011 there was a regular living kidney transplant programme (average of 13.5 transplantations per year) performed at the University Department of Urology, mostly by 1 urologist. In addition, 18 LDKTx were performed in patients from Kosovo [3].

How could the kidney transplant programme be improved?

According to the first publication ever concerning the regional data, organ donation and transplant activities are insufficient in the majority of Balkan countries and they are predominantly based on regular living donor kidney transplantation (LDKTx) [4]. There are certainly many various and specific reasons why transplant programmes in all of these countries are still underdeveloped. It was obvious that the healthcare systems and professionals in developing countries failed to enable organ transplantation as a basic human right for the best treatment option in patients with CKD, which should be in fact equally distributed all over the world [5]. However, in addition to the economic constraints of the country, the most tragic issue is the existing organ trafficking and related complications as a consequence of such an adventure, which is even more expensive to cover afterwards from the national insurance [6]. Here again, the question remains what could be done by the transplant professionals in order to increase the number of transplantations as the best option for further discouraging organ trafficking [7]. Certainly, the number of living donor related transplants should
be increased as an immediate and prompt action [8]. The next step, especially in the improvement of the deceased donor transplant programme, should be the creation of an official waiting list of candidates for deceased donor transplantation. On the other hand, an important prerequisite for a successful transplant programme would be the governmental support with necessary organizational and infrastructural investments to update the legislation, establish the national and hospital transplant coordinators and raise public awareness on the number of potential deceased donors through permanent media presentation [5].

**The impact of the South Eastern Europe Health Network (SEEHN) and Regional Health Development Centre (RHDC) Croatia on organ donation and transplantation improvement**

In order that something be improved one should be aware of the prerequisites for such an improvement. Fortunately, such an assessment was possible after our involvement into the South Eastern Europe Health Network (SEEHN) initiative operating under the Regional Cooperation Council, as a successor to the Stability Pact for South-eastern Europe (SEE). In fact, all the Balkan countries involved were supported by the newly created Regional Health Development Centre (RHDC) on Organ Donation and Transplant Medicine established in Croatia (Zagreb) as a competent regional resource centre assisting SEEHN countries to create or improve their own donation and transplantation programmes [9].

Thus, at the very first professional meeting (27–28 May 2011 in Skopje, Macedonia), the organ donation and transplantation needs of each country within the SEE geographical region were addressed. Since SEEHN operates in close coordination with the Ministries of Health (MOH) they become quite aware of the current situation and needs to accomplish a few steps for further improvement of the transplant programme. Thus, after the creation of the needs and action plan the interrelation with the authorities was to be established for their implementation into improvement of kidney transplant practice.

**Macedonian kidney transplant programme improvement in 2012/13**

Governmental support is essential for any progress in medicine and especially in such a complex multidisciplinary system as is kidney transplantation. Thus, the transplant professionals had a couple of meetings with the MOH and health insurance fund authorities. Looking for the reason for the small number of transplants even in the presence of prepared LD pairs two essential problems were established. First, the low number of professionals involved into the field of kidney transplantation, and second, a very low reimbursement per transplant procedure allocated according to the DRG code at the Urology Department. Thus, once the problems were recognized, transplant professionals in R. Macedonia along with the health care authorities have proceeded to sort them out.

As an immediate action, 3 urologists and 2 nephrologists were supported through RHDC and the MOH for a short stay in Zagreb, Croatia, at the Urology and Nephrology Department at the University Clinical Centre, Rebro [3]. Furthermore, the budget per transplant procedure DRG code was substantially increased from 3,500 to 10,000 Eur, generating a positive budget at the Department of Urology. In addition, the surgical team was composed of 3–4 urologists (donor nephrectomy and transplantation) and a vascular surgeon for the vessel anastomoses. Furthermore, the limited capacity of our transplant centre was enlarged by 1 bed (in total 5 beds) with a changed practice that donors may be hospitalized in the regular wards. In order to speed up the turnover in the transplant centre and prevent graft hypoperfusion and related consequences of acute tubular necrosis, delayed graft function and prolonged hospitalization, the anaesthesiological treatment during the procedure with mean arterial pressure (MAP) of at least 85 mmHg was modified. We also came to a consensus to remove the urocatheter at 5–7 days [10]. Finally, we assumed hospital discharge as early as possible with frequent outpatient visits in the following weeks to the Departments of Nephrology and Urology.

**Future perspectives**
At the end of the year 2012, after 24 successfully performed LDKTx procedures over a period of only 7 months, we were pleased to report that all these steps have led to a 4-fold improvement as compared to the year 2011 [3]. As for the first half of the year 2013, we are proud to report 28 LDKTx already performed, awaiting 40 KTx at the end of the year (Figure 1).

![Figure 1 – Number of kidney transplantations per year in the period 1996–2013](image)

**Abbreviations:** KOS – Kosovo; CAD – Cadaveric

As for the future, we should initiate the deceased donor programme once bylaws from the MOH are enacted and an infrastructure established. Indeed, we will certainly need a deceased donor programme even in order to sustain the already established high number of transplantations per month/year since the potential of the living kidney donors may be exhausted.

Second, we hope that we can also be supportive of regional collaboration in preparation and transplantation of CKD patients from neighbouring countries (Albania and Kosovo), and also eventually establish regional networking in deceased donor procurement, exchange and allocation practice.

Finally, we can say there are many difficulties and obstacles to achieve successfully transplanted patients, but the victory of the best and unique kidney transplantation treatment and the pleasure of a smile on the patient’s face at discharge may be a substitute for all the efforts and time invested, so be it!

**Conflict of interest statement.** None declared.

**REFERENCES**

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Бубрежната трансплантација (БТ) е најдобар тратман за пациентите со хронична бубрежна слабост (ХБС). Здравствено-економските податоци ја Favoriziraат BT во споредба со било кој тип на дијализна процедура, но multidисциплинарниот практик и потребност на високо ниво на организационо-инфраструктурна се чести пречки за нејзината достапност во најголемиот број на земји во развој.


Поради слабата орган донација и трансплантацијата на бубрежната активност во најголемиот број на земји на Балканот, останува прашањето што би можело да се направи со цел да се овозможи трансплантацијата на органи како основно човеково право за најдобар тратман кое паѓа можното зголемување на бројот на БТЖД, предуслов за програмата на кадаверската трансплантација (КТ) би биле составувачката на официјална листа на кандидати за КТ, организација на инфраструктурна мрежа и зголемување на јавната свест за бројот на потенцијални лица со мозочна смрт преку перманентна медицинска презентација.

Нацето иновирано во Здравствената мрежа на Југославија Европа (ЗМЈЕ) и поддршка од новоформираниот Регионален здравствен развоен центар (РЗРЦ) за донација на органи и трансплантациска медицина во Хрватска (Загреб) се покажа како успешно за тековното подобрување на програмата на BT. На иницијалниот прв професионален состанок (27–28 мај 2011 во Скопје) се потенцира потребите за орган донација и трансплантација на секоја земја од ЈИЕ и еставлиран беше акцијски план за наотамошни чекори кои треба да бидат направени. Оттука, бројот на професионалите (вклучително и васкуларни хирург) иновирани во BT беше зголемен, исто како и значителното зголемување на надоместокот по трансплантациската процедура на Клиниката за урологија.

Тековно, имаме задоволство да соопштиме за 24 БТЖД во 2012, а за 7 месеци од 2013 направени се 28 трансплантации, исклучувајќи ја четириесесетата БТ на крајот на годината. Перспективно, би требало да се инициира програмата за КТ, дури и само за да се одржи веке еставливането висок број на месечни/годишни трансплантации, бидејќи потенцијалот за БТЖД може да биде испорачен. Исто така, се надеваме дека можеме да ја помогнеме регионалната соработка и трансплантација на пациентите со ХБС од соседните земји (Албанија и Косово), и евентуално да ја еставлираме регионална мрежа за обезбедување на органи за КТ, со практикување на можна измена и алокација на органи.