

# STUDY ON THE NEED FOR KIDNEY TRANSPLANTATION AND PATIENTS ON KIDNEY TRANSPLANT WAITING LIST IN LAO CAI PROVINCE 2023

Hoang Giang<sup>1\*</sup>, Trinh Hong Son<sup>1</sup>, Pham Van Thinh<sup>2</sup>, To Minh Hung<sup>2</sup>, Le Thi Thanh<sup>2</sup>, Vu Thi Thu Huong<sup>2</sup>, Nguyen Van Hai<sup>2</sup>, Luong Ngoc Quy<sup>2</sup>, Hoang Van Hieu<sup>2</sup>, Nguyen Viet Hai<sup>2</sup>

<sup>1</sup>Viet Duc University Hospital - 40 Trang Thi, Hoan Kiem, Hanoi, Vietnam

<sup>2</sup>Lao Cai Provincial Hospital - B8 Chieng On, Binh Minh, Lao Cai, Vietnam

Received: 25/09/2023

Revised: 31/10/2023; Accepted: 01/12/2023

## ABSTRACT

**Objectives:** This study aims to determine the need for kidney transplantation and patients on kidney transplant waiting list in Lao Cai province 2023.

**Methods:** A cross-sectional descriptive study was conducted on all patients undergoing hemodialysis at 4 hospitals in Lao Cai province from October 2022 to March 2023.

**Results:** Lao Cai province has 4 hemodialysis units with a need for kidney transplants in the province of 214 people, mainly at the provincial general hospital, with an average age of 50, men making up the majority with more than 60% and the majority of patients have been on dialysis for less than 5 years. 74% of patients in need of a kidney transplant were on the waitlist. Initially, it was determined that Lao Cai has 159 patients waiting for a kidney transplant with an average age of 43 and 61.6% have been on dialysis for less than 5 years. Among these patients, the majority of patients with blood type O account for more than 40%, and the rates of hepatitis B and C are 13.7% and 17.8%, respectively. Chronic glomerulonephritis is the main cause, accounting for more than 80% of patients requiring hemodialysis.

**Conclusions:** In 2023, Lao Cai has 214 patients in need of kidney transplant. 159 patients waiting for a kidney transplant are concentrated mainly at the provincial general hospital with an average age of 43, most of whom have been on dialysis for less than 5 years. The main cause of dialysis is chronic glomerulonephritis.

**Keywords:** Kidney transplant need, kidney transplant waiting list.

---

\*Corresponding author

Email address: Giangbvvd@gmail.com

Phone number: (+84) 912 649 187

<https://doi.org/10.52163/yhc.v64i13.870>

## 1. INTRODUCTION

Kidney transplantation is one of the great achievements of medicine in the twentieth century, helping to improve and prolong the lives of hundreds of thousands patients worldwide each year [1]. After the first successful kidney transplant in 1954 in the United States, along with outstanding developments in techniques, equipment and immunosuppressive therapy, kidney transplant has become an option for many patients with end-stage renal disease [2]. Kidney transplant in particular and organ transplant in general can only be performed successfully when strictly following 4 steps: Prepare the recipient; Prepare the donor; Prepare human and technical resources; Plan for hospitalization, monitoring and post-transplant care. The list of patients waiting for a kidney transplant plays an important role in preparing and selecting recipients. In advanced countries around the world, a kidney transplant coordination network has been established with an important role in building a list of patients who want to wait for a kidney transplant, kidney donors, and controlling matching based on the order of the kidney transplant. In the US, as of December 31, 2020, there were 91,455 patients waiting for a kidney transplant. On average, every day: 101 patients are put on the transplant waiting list, 13 patients die while waiting for a kidney transplant. In 2020, the United States transplanted 23,643 kidneys, of which 18,409 were from deceased donors and 5,234 were from living donors [3].

In Vietnam, as of June 20, 2023, there were 24 health care facilities performing kidney transplants. These facilities are mostly general and specialized hospitals at the central level, concentrated mainly in Hanoi and Ho Chi Minh City. In the North, besides Hanoi, some provincial general hospitals have also deployed kidney transplant techniques such as: Phu Tho Provincial General Hospital, Viet Tiep Hospital, Hai Phong.

The need for a kidney transplant is the initial data to identify patients with end-stage kidney disease who require hemodialysis. The list of patients waiting for a kidney transplant is a list of patients in need of a kidney transplant and initially determined to have a doctor's indication for a kidney transplant. The transplant waiting list is an unstable list, always changing and

updated over time. Lao Cai Provincial General Hospital is the highest-level hospital in Lao Cai province, classified as a Grade I hospital with 800 beds and 42 departments and divisions. The total number of hospital staff is 712, including 178 doctors. The hospital has spacious facilities, built completely new on an area of 26 hectares with Government bond capital; Modern and synchronous machinery and equipment invested from Korean ODA loans. Lao Cai Provincial General Hospital is a satellite hospital of central hospitals such as Viet Duc University Hospital and Bach Mai Hospital. Up to now, the hospital has performed many high-tech techniques such as spinal surgery, neurosurgery surgery, trauma surgery, vascular surgery, endoscopic digestive surgery, urology... [4]

Implementing the 2021 Science and Technology tasks of the People's Committee of Lao Cai province according to contract No. 16/2022/HDKHCN dated March 4, 2022 of the Lao Cai Department of Science and Technology and Lao Cai Provincial General Hospital with the goal of: Assessing the current situation of brain-dead patients and developing a list of patients waiting for organ transplants, assessing the conditions of facilities, equipment, human resources and organizing organ transplants at the hospital. A research team led by the project leader, director of the provincial general hospital in collaboration with the national organ transplant coordination center and experts conducted research on the topic "Determining the need for kidney transplant and List of patients waiting for kidney transplant in Lao Cai Province" with the goal:

***Describe the need for kidney transplant and list of patients waiting for kidney transplant in Lao Cai province in 2023.***

## 2. RESEARCH SUBJECTS AND METHODS

**2.1. Study design:** A cross-sectional descriptive study was conducted on all patients undergoing hemodialysis at 4 hospitals in Lao Cai province from October 2022 to March 2023.

### **2.2. Study location and time of implementation**

Location: Four hemodialysis facilities in Lao Cai province.



Time: From October 2022 to March 2023.

### 2.3. Study subjects

Legal documents on organ donation and transplantation. Documents related to patients with end-stage renal disease requiring hemodialysis (TNT).

All patients undergoing hemodialysis at healthcare facilities in Lao Cai province meet the following selection and exclusion criteria:

- Selection criteria:

Patients with end-stage kidney disease undergoing hemodialysis at all dialysis facilities in Lao Cai province.

- Exclusion criteria:

+ Patients with end-stage kidney disease undergoing peritoneal dialysis;

+ Patients undergoing emergency dialysis;

+ Patients with stage 3b chronic kidney disease who are indicated for a kidney transplant but do not require hemodialysis.

### 2.4. Sample size and sampling method

All patients are undergoing hemodialysis at all dialysis facilities in Lao Cai province.

### 2.5. Research variables

- Dialysis facilities and number of patients undergoing hemodialysis in Lao Cai province

- General information about patients in need of kidney transplant in Lao Cai

- Medical history and duration of dialysis of patients in need of kidney transplant

- Tests and causes of dialysis for patients in need of kidney transplant.

- General information about patients waiting for a kidney transplant in Lao Cai

- Tests and causes of dialysis for patients waiting for a kidney transplant.

### 2.6. Techniques, tools, and data collection processes

Create a form “Summary of patient profile waiting for kidney transplant” with basic information groups: Administrative, historical, clinical. Then the research team conducted training for the information collection team, collected data according to the designed form, edited and agreed upon within the research team, entered it into the computer and conducted analysis and statistics. The information is collected from the patient’s medical records stored at the hospital.

**2.7. Data analysis:** Data were entered and analyzed using IBM SPSS Statistics 20.0

**2.8. Study ethics:** All patient information is kept confidential and approved by hospital directors. Research results help patients undergoing dialysis have the opportunity to access kidney transplants from brain-dead donors to improve public health.

## 3. RESULTS

### 3.1. Determining the need for kidney transplant in Lao Cai province

*Table 1: Healthcare facilities and number of HD patients in Lao Cai province*

Name of dialysis facilities	Quantity (n)	Percentage (%)
Lao Cai Provincial General Hospital	175	81.8
Bac Ha District General Hospital	17	7.9
Sa Pa District Medical Center	12	5.6
Si Ma Cai District Medical Center	10	4.7
	<b>214</b>	<b>100</b>

There are a total of 4 hemodialysis units in the province with 214 patients undergoing dialysis, of which Lao Cai Provincial General Hospital is the main one, accounting for 81.8%.

**Table 2: General information about patients in need of kidney transplant in Lao Cai**

<b>Gender</b>	<b>Quantity (n)</b>	<b>Percentage (%)</b>
Male	132	61.7
Female	82	38.3
<b>Total</b>	<b>214</b>	<b>100</b>
<b>Age</b>	<b>Quantity (n)</b>	<b>Percentage (%)</b>
< 20	4	1,8
20-40	59	27,6
<40-60	96	44,9
> 60	55	25,7
Mean	50 (17-96)	
<b>Total</b>	<b>214</b>	<b>100</b>

Patients are 61.7% male and 38.3% female. The average age of patients in need of a kidney transplant is 50.

**Table 3: Medical history and dialysis duration of patients in need of kidney transplant**

<b>Characteristics</b>	<b>Contents</b>	<b>Quantity (n)</b>	<b>Percentage (%)</b>
<b>Medical history</b>	No	44	20.6
	Yes	170	79.4
<b>Dialysis duration</b>	< 5 years	140	65.4
	5-10 years	34	15.9
	> 10 years	9	4.2
	Unknown	31	14.5

65.4% patients undergoing dialysis had dialysis duration of less than 5 years.



**Table 4: Tests and causes of dialysis for patients in need of kidney transplant**

Characteristics	Contents	Quantity (n)	Percentage (%)
<b>Blood type</b>	Unknown	<b>46/214</b>	<b>21.5</b>
	A	33	19,8
	B	52	31,1
	O	73	43,7
	AB	9	5,4
	Total	167	100
	Unknown	<b>126/214</b>	<b>58.9</b>
<b>HIV</b>	Negative	88	100
	Positive	0	0
<b>HBV</b>	Negative	77	87.5
	Positive	11	12.5
<b>HCV</b>	Negative	74	84.1
	Positive	14	15.9
<b>Causes of dialysis for patients in need of kidney transplant.</b>	Chronic glomerulonephritis	156	72,9
	Hypertension, diabetes	26	12,1
	Urinary stones	31	14,5
	Lupus	1	0,5

Data on patients' blood types is missing a lot (21.5%), however, people with blood type O still account for the largest number of patients with 43.7%.

Chronic glomerulonephritis is the main cause

(accounting for 73%) of chronic kidney failure in patients in need of a kidney transplant.

### 3.2. List of patients waiting for kidney transplant in Lao Cai province

**Table 5: General information about patients waiting for a kidney transplant in Lao Cai**

Gender	Quantity (n)	Percentage (%)
Male	99	62
Female	60	38
<b>Total</b>	<b>159</b>	<b>100</b>
Age	Quantity (n)	Percentage (%)
< 20	4	2,5
20-40	59	37,1
<40-60	96	60,4
<b>Total</b>	<b>159</b>	<b>100</b>

Gender	Quantity (n)	Percentage (%)
Mean	43	
Dialysis duration	Quantity (n)	Percentage (%)
< 5 years	98	61,6
5-10 years	26	16,4
> 10 years	9	5,6
Unknown	26	16,4
<b>Total</b>	<b>159</b>	<b>100</b>

The ratio of patients waiting for a kidney transplant per patients in need of a kidney transplant in Lao Cai is  $159/214 \approx 74.3\%$ . Nearly three-quarters of patients waiting for a kidney transplant have been on dialysis for less than 5 years, and only 6% of patients have been on dialysis for more than 10 years.

*Table 6: Tests and causes of dialysis for patients waiting for a kidney transplant*

Characteristics	Contents	Quantity (n)	Percentage (%)
<b>Blood type</b>	A	28	23,9
	B	34	29,1
	O	48	41
	AB	7	6
	Tổng	117	100
<b>HIV</b>	Negative	73	100
	Positive	0	0
<b>HBV</b>	Negative	63	86,3
	Positive	10	13,7
<b>HCV</b>	Negative	60	82,2
	Positive	13	17,8
<b>Causes of dialysis for patients waiting for a kidney transplant.</b>	Chronic glomerulonephritis	130	81,8
	Hypertension, diabetes	13	8,2
	Urinary stones	15	9,4
	Lupus	1	0,6
	<b>Total</b>	<b>159</b>	<b>100</b>

41% of patients waiting for a kidney transplant with blood type O, 17.8% have hepatitis C; 13.7% have hepatitis B. 81.8% of the causes of dialysis for patients waiting for a kidney transplant are chronic glomerulonephritis.



#### 4. DISCUSSION

With a population of Lao Cai in 2022 of about 770,000 people, the need for kidney transplants in Lao Cai is estimated at 28 patients/100,000 people. This index is significantly lower than Hanoi at 38 people/100,000 people (According to Hoang Giang's 2020 study data in Hanoi) [5].

3/4 of patients in need of a kidney transplant are of working age, 2/3 are men, this is one of the huge losses in labor and wealth contribution to society. The average age of patients in need of a kidney transplant in our study is 50 years old (also similar to the average age of patients in need of a kidney transplant in Hanoi, which is 53). The age group from 41 to 60 years old accounts for the highest proportion with 44.9%, while this age group on the patient waiting list for transplant is up to more than 60%. Analyzing age characteristics in other studies also shows similar results in terms of average age or proportion of age groups from 20 to 60 [6]. Age grouping allows a preliminary assessment of patients for kidney transplantation. Dialysis in the elderly (60 years and older) is always considered when compared kidney transplantation. The balance between benefits and risks during the transplant process and post-transplant care. In Vietnam, according to the guidance of the Ministry of Health, the recommended age for kidney transplant is no more than 60. However, in the world the rate of kidney transplant in the elderly is increasing and the evaluation of post-transplant results is increasing. In these patients, it is more feasible than in the non-transplant group. In Europe, the Eurotransplant Senior Program (ESP) allows recipients over 65 to receive kidneys from donors over 65 [7].

In the world, hypertension and diabetes are the two main causes of chronic kidney failure. In Vietnam, chronic glomerulonephritis is the leading cause of chronic kidney failure. This cause can be explained by the habit of Vietnamese people to only go to the doctor when the body is very tired and weak (no habit of regular health check-ups) so when he came for medical examination, he had late-stage chronic kidney failure and so the cause of end-stage chronic kidney failure could be the consequence of chronic kidney failure, hypertension, diabetes or unknown cause. In Lao Cai,

one of the causes of chronic kidney failure is urinary stones.

Patients in need of a kidney transplant and patients waiting for a kidney transplant who have been on hemodialysis for less than 5 years account for the majority with 65.4% and 73.7% respectively. This rate is also different from Hoang Giang's 2020 study, patients with hemodialysis duration of over 5 years accounted for the majority with about 65%. This result may be a consequence of the COVID-19 pandemic when about 1/3 of patients undergoing dialysis at the provincial general hospital died (50 patients). This is a particularly vulnerable group of people because they often have to undergo dialysis at the hospital (3 times a week), so the risk of illness and death is higher.

In high income countries with modern medicine and a very large number of patients receiving organ transplants in general and kidney transplants in particular, such as the US, Spain, Japan..., the time patients undergo hemodialysis must be waiting for a kidney transplant ranges from 3-5 years. In Japan, dialysis patients sometimes have to wait up to 15 years to receive a kidney transplant [8]. The above information shows that the shortage of kidney transplants compared to demand is very large not only in Vietnam but also in all countries around the world.

Patients with blood type O often have to wait the longest. This is because people with type O blood can only receive kidneys from donors with type O blood. However, donors with type O blood can donate kidneys to any blood type, making the need for kidneys from O blood type donors become very high. 17.8% of patients on the kidney transplant waiting list are infected with hepatitis C, 13.7% are infected with hepatitis B. According to some studies, the rate of hepatitis C infection in some dialysis units can be up to 40%. Patients waiting for a kidney transplant are infected with hepatitis B and C, which greatly affects the patient's health as well as the patient's arrangement of waiting time for a transplant. People with hepatitis B and C who are unstable on treatment will be taken off the national transplant waiting list until they are stable on treatment and ready for a kidney transplant. Therefore, preventing patients undergoing dialysis from infectious

pathogens allows patients to have more opportunities to access kidney transplants. In the past, patients with hepatitis B and C often had contraindications for kidney transplantation, but today, thanks to the advancement of antiviral drugs as well as the effectiveness of anti-rejection drugs, it has helped patients with hepatitis B and C have the same opportunity to receive a kidney as other normal people, and donors with hepatitis B and C can also donate kidneys. In-depth tests for diagnosis and treatment such as CT scans, MRIs, stomach and colon endoscopy... are performed very rarely. 100% of hemodialysis patients are currently covered by Health Insurance. The inspection and monitoring of specialized indications (high-cost indications) of Health Insurance also makes some doctors afraid of being discharged if not eligible.

In Vietnam, HIV infection is an absolute contraindication for kidney transplantation [9]. However, in the world (in the US and many European countries), HIV-infected patients on hemodialysis still receive kidney transplants from HIV-infected donors [10]. This is one of the great advances in science, creating conditions for HIV-infected patients to improve their quality of life.

## 5. CONCLUSION

In 2023, Lao Cai has 214 patients in need of kidney transplant at 4 dialysis units in the province, of which more than 80% are concentrated at the provincial general hospital.

159 patients were put on the national kidney transplant waiting list (accounting for about 75% of the kidney transplant need) with an average age of 43 years old, more than 60% of them were men.

The majority of patients waiting for a transplant on dialysis are less than 5 years with blood type O mainly. Nearly 20% of patients waiting for a kidney transplant

have hepatitis C, the cause of end-stage chronic kidney disease is mostly chronic glomerulonephritis.

## REFERENCES

- [1] Carmona M, Álvarez M, Marco J et al., Global Organ Transplant Activities in 2015. Data from the Global Observatory on Donation and Transplantation (GODT); Transplantation, 2017, 101, S29.
- [2] Hatzinger M, Stastny M, Grützmacher P et al., The history of kidney transplantation; Urol Ausg A, 55(10), 2016, 1353–1359.
- [3] K. L. Lentine, J. M. Smith, A. Hart et al., OPTN/SRTR 2020 Annual Data Report: Kidney
- [4] <https://bvdklaocai.vn/>. Accessed 15/8/2023.
- [5] <https://www.gso.gov.vn/>. Accessed 15/8/2023.
- [6] Duong CM, Olszyna DP, Nguyen PD et al., Challenges of hemodialysis in Vietnam: experience from the first standardized district dialysis unit in Ho Chi Minh City; BMC Nephrol, 2015, 16, 122.
- [7] Veroux M, Grosso G, Corona D et al., Age is an important predictor of kidney transplantation outcome; Nephrol Dial Transplant Off Publ Eur Dial Transpl Assoc - Eur Ren Assoc, 27(4), 2012, 1663–1671.
- [8] <https://www.jotnw.or.jp/en/>. Accessed 15/8/2023.
- [9] Vietnam kidney transplant guideline, Medical publishing house, 2017.
- [10] Zheng X, Gong L, Xue W et al., Kidney transplant outcomes in HIV-positive patients: a systematic review and meta-analysis. AIDS Res Ther, 16(1), 2019, 37.

