

Case Report

Open Access Journal



Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

Khin Phyu Pyar¹, Sai Aik Hla², Win Kyaw Shwe³, Zarni Htet Aung², Thein Tun Myint², Thurein Win², Aung Phyo Kyaw², Aung Zaw Htet⁴, Kyaw Thu Yein Lwin⁵, Lay Maung Maung⁵, Ye Min Hein⁵, Myo Maung Maung⁶, Zin Zin Aung⁶, Aung Kyaw Khine⁷, Tun Tun Oo⁷ & Myat Ko Ko⁷

¹Professor and Head/ Senior Consultant Physician and Nephrologist, Department of Medicine/ Nephrology, Defence Services Medical Academy/ No. (1) Defence Services General Hospital (1000-Bedded), Yangon, Myanmar.

²Senior Consultant Physician, No. (1) Defence Services General Hospital (1000-Bedded), Yangon, Myanmar.

³Senior Consultant Nephrologist, Department of Nephrology, No. (2) Defence Services General Hospital (1000-Bedded), Nay Pyi Taw, Myanmar.

⁴Senior Consultant Nephrologist, Department of Nephrology, No. (1) Defence Services General Hospital (1000-Bedded), Yangon, Myanmar.

⁵Consultant Nephrologist, Department of Nephrology, No. (1) Defence Services General Hospital (1000-Bedded), Yangon, Myanmar.

⁶Consultant Nephrologist, Department of Nephrology, No. (2) Defence Services General Hospital (1000-Bedded), Nay Pyi Taw, Myanmar.

⁷Nephrology Fellow, Department of Nephrology, Defence Services Medical Academy, Yangon, Myanmar.

Abstract:

Case Summary

The average life expectancy in Myanmar is 66.8 years according to WHO (2020). We presented two cases of successful living kidney transplant in 72 years and 73 years old women; they had maintenance hemodialysis for 3 months and 2 years respectively for end stage renal disease (ESRD) due to long standing diabetes mellitus. The upper limit of age of recipient for living donor kidney transplant was discussed. Age per se should not represent a barrier to transplantation.

Key words: life expectancy, age of recipient, renal transplant

Copyright: © 2021 The Authors. Published by Medical Editor and Educational Research Publishers Ltd. This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).



Corresponding Author: Khin Phyu Pyar

Introduction

Renal transplant is one of the best treatment options for patients with end stage renal disease (ESRD). Regarding the age issue in renal

transplant, the graft survival was better with younger recipient and younger donor. As of the age of donor and recipient, giving kidney from

Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

younger donor to older patient had better outcome than that of older donor to younger recipient (Andrés, 2010). The donor kidney morphology parameters were significantly associated with early renal allograft function, especially when the age of the donor was 55 years and above (Qiu et al., 2020). Generally, the transplant team is reluctant to perform renal transplant if the age of recipient is over 65 years. There were less reports on upper limit of age of recipient in relation to the age of life expectancy in particular country.

The average age of life expectancy is governed by several factors and it varies with socio-economic status of country concerned. WHO data published in 2020 stated that the life expectancy in Myanmar is 65.9 years for male and 72.2 years for female; therefore, average total life expectancy is 69.1 years. Regarding ranking of cause of death in Myanmar, Diabetes mellitus is the fourth and kidney disease is the ninth according to WHO.

In the elderly, all organs are not functioning well like youth. Moreover, the atherosclerosis process in arterial wall is increasing with age; making the vascular anastomosis difficult. The prevalence of coronary artery disease as well as cerebrovascular disease are higher in older age group. Both the function of lungs and liver metabolism fall with age. Therefore, old age is the high risk for major surgery and anaesthesia. The incidence of comorbidity increased with age. The good point of doing transplant in older recipient age is that they have lower risk of rejection because the immune system weakens with age (Huang et al., 2009). The question on maximum age of recipient for living donor kidney transplant was discussed.

Case Presentation (Case 1)

The patient was 73 years old lady; she had end stage renal disease (ESRD) for 2 years and maintenance hemodialysis for 1 year. The cause of ESRD was diabetes mellitus; she had left pyelolithotomy in 2001 and right lithotripsy in 2014. She had 9 children and 24 grandchildren; and abdominal sterilization was done at the age of 40. She was doing cooking, eating, toileting, bathing, and washing on her own. Her memory was normal. Her residual urine output was 500 cc/day. She was on Telmisartan 40 mg Hs, Duracard 4 mg BD, Renavel 800 mg TDS, Duloxetine 1 OD, and Atorvastatin 20 mg Hs.

She received ABO matched living kidney from one of her grandchildren who was 30 years old.

Regarding immunological typing, CDC cross match was negative. DSA was positive at A11:02 MFI 1109 and A11:01 MFI 926.

Her blood pressure required calcium blocker to maintain at 130/80 mmHg; ECG was normal. Echocardiogram revealed LVEF 65%; normal LV systolic function; mild diastolic dysfunction; concentric LVH; no pericardial effusion; and no pulmonary hypertension. Coronary angiogram was consistent with single vessel coronary artery disease at left circumflex artery with lumen narrowing less than 30%.

Carotid doppler showed calcified plaque in right internal carotid artery without stenosis and left carotid artery was normal. She had diverticulum in colon; histology was benign.

Screen tests for malignancy (mammogram, cervical pap smear, alpha fetoprotein, CA125, CA15-3, CA19-9 and CEA) were negative.

There were atherosclerotic changes in abdominal aorta, both renal arteries and both common iliac arteries in CT angiogram; however, right external iliac artery did not have significant atherosclerosis. Her serum calcium level was 2.42 mmol/l; phosphate was 1.58; and serum PTH was raised 198 (15-65).

Infection screen were negative (HBV, HIV, HCV, tuberculosis IGRA, KTVDRL, COVID19) except CMV (Ig G positive).

As she had standard immunological risks, she was given ATG (Equine). She received triple immunosuppressive therapy (steroid, mycophenolate mofetil and tacrolimus). Both intraoperative and post-operative period were uneventful. Now, she is in post-transplant 6 months.

Case Presentation (Case 2)

Second case was 72 years old doctor; she had end stage renal disease (ESRD) for 1 years and maintenance hemodialysis for 2 months. She had long standing diabetes mellitus for 30 years. She had 3 children; total abdominal hysterectomy was done 27 years ago. Her BMI was 28 kg/m² (Dry wt- 74.1 kg, Height 5 ft 4 inches). She had good memory; good appetite; her movements were slow

Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

because of knee joint pain; she required one person to assist during bath. Her residual urine output was 500 cc/day. Her children as well as grandchildren gave excellent care.

She received ABO matched living kidney from her daughter who was 41 years old. Regarding immunological typing, CDC cross match was negative. DSA was positive at A43:01 MFI 4036 and A26:01 MFI 4315. Therefore, she had standard immunological risk. Infection screen were negative (HBV, HIV, HCV, tuberculosis IGRA, KTVDR, COVID19) except CMV (Ig G positive). ECG was normal. Chest radiograph showed cardiomegaly without features of heart failure. Echocardiogram revealed mild to moderate left ventricular hypertrophy; preserved LV systolic function with LVEF of 65-70%; Grade 2 diastolic dysfunction; mild calcification on aortic and mitral valves. CT calcium score was normal with the total calcium score 1083. Coronary Angiogram was consistent with minor coronary artery disease. Carotid doppler was normal apart from hard calcified plaque in both carotid bulbs. Screen tests for malignancy (mammogram, cervical pap smear, alpha fetoprotein, CA125, CA15-3, CA19-9 and CEA) were negative. She was anemic (Hb 7.4 gm%). Ultrasound abdomen showed bilateral nephropathy with multiple gall bladder stones without features of cholecystitis. Doppler USG both lower limbs revealed marginal calcification in both femoral arteries and increased flow velocity in dorsalis pedis artery likely increased peripheral artery resistant. CT abdomen and pelvis revealed the followings: (1) atherosclerotic arteries of lower thoracic aorta, whole abdominal aorta, bilateral common iliac arteries, internal iliac arteries and external iliac arteries; (2) calcified hepatic lesion at segment VIII of liver; (3) three small stones in gall bladder; (4) small hyperdense lesion in upper pole cortex of left kidney, probably haemorrhagic cyst; (5) left renal small cortical cyst (Bosniak I); (6) degenerative spine changes with PID at L2-3 level; and, (7) calcified area at mesentery of right side of abdomen, probably calcified lymphadenopathy.

Her medications were laxis 250 mg OD, Metoprolol XL 12.5 mg OD, Metolazone 2.5 mg OD, Nifedipine 20 mg BD, Acarbose 50 mg BD, Linagliptin 5 mg OD, Nucid 1 tab BD, Clopilet 75

mg OD, Eltroxin 50 ug 1 OD, Natrilix SR 1.5 mg OD and Atovastatin 20 mg HS.

She was primed with Basiliximab; she also received triple immunosuppressive therapy (steroid, mycophenolate mofetil and tacrolimus). Both intraoperative and post-operative period were uneventful. Now, she is in post-transplant 2 months.

Discussion

The prevalence of patients with end-stage renal disease (ESRD is increasing worldwide; and, the same applies for elderly population. Kidney transplantation has survival benefit over dialysis for the majority of patients; therefore, it is considered as the preferred treatment option. Immunologic, physiologic, and psychosocial factors influence transplant outcomes and should be recognized in the care of the elderly transplant patient. There are several factors determining the outcome of kidney transplant recipient: age of donor, age of recipient, comorbid conditions, type of donor, immunological matching, blood group matching etc. Waiser et al pointed out that donor and recipient age are important risk factors influencing the outcome after renal transplantation; therefore, should be considered carefully (Waiser et al., 1997). Many centers are reluctant to accept elderly patients to the waiting list. With increased comorbidity and shorter life expectancy in elderly population, the magnitude of improved patient survival with transplantation is limited (Rana et al., 2017). One cohort study found that kidney transplant patients over 70 years had good short-term outcomes; however, the rate of decline of graft survival over time is steeper in the older age group, possibly due to decreased patient survival (Mehta et al., 2023). Among patients with end-stage renal disease, healthier patients are placed on the waiting list for transplantation, and long-term survival is better among those on the waiting list who eventually undergo transplantation (Wolfe et al., 1999).

The age of the recipient has some issues which changes with time. In the case of elderly renal transplant recipients, the cut-off point for age to perform renal transplant is not clear; however, the older patient cohorts studies showed that survival and cost-effectiveness in elderly patients after transplant was better than that of elderly patients on the waiting list for transplant (Bashir & Alfaki,

Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

2023). Recipient with younger age, less than 18 years, has ethical issues. Kidney transplantation in recipient with older age is challenging in view of survival benefits. The good point of doing renal transplant in 60 years and older was that the degree of panel-reactive antibody sensitization did not appear to affect survival after transplant (Awad et al., 2019).

On the other hand, several studies have reported acceptable outcomes was noted in selected elderly patients. One study pointed out that patients older than 80 years with ESRD had a survival benefit with kidney transplantation compared to those with continued dialysis (Lønning et al., 2016). They also highlighted that the graft and patient survivals in recipients aged 80 years were comparable with recipients aged 70 to 79 years at transplantation; moreover, they found that an estimated 5 years survival rate was 55% post-engraftment for an 80 years old patient with end-stage renal disease. Their final recommendation was that age by itself should not be an absolute contraindication against renal transplantation (Baid-Agrawal & Frei, 2007).

When dealing with elderly, the age criteria for elderly varies with his average age of life expectancy of his country. The average age of life expectancy is governed by several factors and it varies with socio-economic status of the country concerned. In Norway, the life expectancy is 82.6 years; she has a World Life Expectancy ranking of '10' (WHO, 2020). The researchers from Norway suggested that 'age over 80 years' was not be an absolute contraindication against renal transplantation (Lønning et al., 2016); in fact, it was less than the age of life expectancy. WHO data published in 2020 stated that the life expectancy in Myanmar is 65.9 years for male and 72.2 years for female; therefore, average total life expectancy is 69.1 years. Both patients involved in this case reports are over 72 years; more than the age of average total life expectancy in Myanmar. This is one reason for reporting case.

Even for second transplant, Heldal et al found that the outcomes of older recipients with second transplants were comparable to the outcomes of age-matched first transplant recipients; therefore, older transplant candidates should not be remaining on dialysis treatment if first transplant fails (Heldal et al., 2017). Furthermore, they also

pointed out that advanced age by itself should not be a contraindication for re-transplantation and the best results are achieved with short time on dialysis before re-transplantation.

Both patients in this case report are very active physically as well as mentally. First patient is stronger than second; she has been managing her own restaurant for 40 years. In other words, both are not frail. As patients who have frailty in pre-transplant assessment are more likely to experience surgical complications, delayed graft function, a longer hospital-stay and recovery. Therefore, analysis of frailty is extremely important in assessing eligibility for kidney transplant in patient with age over 65 years. Frailty is typically measured by using assessment tools that look at the ability to complete activities of daily living, risk of developing bed sores, and the likelihood of falling. Furthermore, finding for living donor plays a role in elderly recipient because the kidneys from living donors are more likely to function immediately and provide better outcomes than the kidneys from deceased donors (Yemini et al., 2021) (Legeai et al., 2018). Yemini et al also suggested that the decision on elderly candidates for transplant should be based on the patient's comorbidity and predicted life expectancy as they found no significant difference in outcome was seen between the two different age groups; over 60 years and over 70 years (Rao et al., 2007). It is comparable with the National Transplant committee in Israeli; they recommend to ignore recipients' chronological age in organ allocation if there is no medical cause for differentiation on the basis of age (Katvan et al., 2017).

Furthermore, the Euro-transplant Senior Program was introduced in western country to promote local allocation of older kidneys to older donors. It has several advantages: more elderly received a kidney transplant; age-matching with mandatory local/regional allocation; facilitating short cold ischemia; reintroduction of minimal histocompatibility criteria (i.e., HLA-DR matching) (Huang et al., 2009); and disregarding former exchange principles based on matching for HLA antigens (Dreyer & de Fijter, n.d.).

Elderly population is growing in developed countries; therefore, the prevalence of ESRD in elderly is booming (Dempster et al., 2013). And,

Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

they are waiting for transplant. Hence, transplantation in elderly recipients is difficult if 'fixed age issue' is applied. Therefore, adult kidney transplanted cases were studied in year 2000; it involved over one thousand cases. They compared patient and graft survival, risk and causes of graft failure and patient death among four age groups (18–49, 50–59, 60–64 and >65). The incidence of comorbidity increased with age. The groups had comparable HLA matching, but patients aged 18–49 years received transplants from younger donors and with shorter cold ischaemic times. Younger patients had more acute rejection and less delayed graft function. Older patients had a higher incidence of death with functioning graft. Patients over 65 years had an almost dialysis-free remaining life, while the graft half-life was significantly shorter than patient half-life in the youngest group. Transplantation in elderly recipients is worthwhile despite a higher comorbidity (Oniscu et al., 2004) (Baid-Agrawal & Frei, 2007) (Legeai et al., 2018).

Beerli et al highlighted that age alone might not be an accurate measure for risk prediction and clinical decision making in kidney transplantation as there was non-linear relationship between age and graft loss (Beerli et al., n.d.) (TIDSS). European Urology Society reported that renal transplantation is a safe and effective therapy for the older renal failure patient in the absence of identified risk factors; their graft survival is equivalent to that seen in younger patients (Faravardeh et al., 2013).

Conclusion

The upper age limitation for renal transplant recipient should be individualized. The frailty, cognitive function, and social support are equally important as comorbid diseases in assessing elderly living donor renal transplant recipients; age per se should not represent a barrier to transplantation. This case report gives some evidence to support an absolute upper age limit for renal transplantation in Myanmar. Careful selection rather than a fixed age limit should be used to ensure a satisfactory graft and patient survival.

Acknowledgements

The authors would like to thank the patients and family for giving consent to this article. Also, to all doctors and nursing team for making great efforts in caring them in two transplant centers. The authors acknowledged the following team from two centers; Professor Khin Maung Maung Than, our teacher, Professor Than Aye and Urosurgical team, Professor Yan Naung and vascular team, Professor Yu Aye Latt and ICU team, Professor Ohmar Hlaing and radiology team, Professor Tin Moe Mya and pathology team, Professor Khine Khine Su and microbiology team, Professor Myint Zaw, Professor Thet Naing, Professor Aung Myat Kyaw, Professor Thet Aung, Professor Kyaw Zay Ya and Professor Ko Ko Lwin for administrative support.

Declaration of conflict of interest

The authors declared no potential conflicts of interests with respect to authorship and publication of this article.

Ethical approval

Our institution does not require ethical approval for reporting cases.

Funding

The authors received no financial support for publication of this article.

Informed consent

The informed consent for publication in this article was obtained from both recipient and donor.

References

1. Andrés, A. (2010). Indications and contraindications of living-donor kidney transplantation. *Nefrología (English Edition)*, 30, 30–38. <https://doi.org/10.3265/Nefrologia.pre2010.Nov.10689>
2. Awad, M. A., Czer, L. S. C., Emerson, D., Jordan, S., De Robertis, M. A., Mirocha, J., Kransdorf, E., Chang, D. H., Patel, J., Kittleson, M., Ramzy, D., Chung, J. S., Cohen, J. L., Esmailian, F., Trento, A., & Kobashigawa, J. A. (2019). Combined Heart and Kidney Transplantation: Clinical Experience in 100 Consecutive Patients. *Journal of the American Heart Association*,

Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

- 8(4), e010570. <https://doi.org/10.1161/JAHA.118.010570>
3. Baid-Agrawal, S., & Frei, U. A. (2007). Living donor renal transplantation: Recent developments and perspectives. *Nature Clinical Practice Nephrology*, 3(1), 31–41. <https://doi.org/10.1038/ncpneph0383>
 4. Bashir, N., & Alfaki, M. (2023). A review of elderly transplantation regarding complications, outcomes, and survival. *Transplantation Reports*, 8(3), 100136. <https://doi.org/10.1016/j.tpr.2023.100136>
 5. Beerli, N., Denhaerynck, K., Binet, I., Dahdal, S., Dickenmann, M., Golshayan, D., Hadaya, K., Huynh-Do, U., Schnyder, A., De Geest, S. M., & Mauthner, O. (n.d.).
 6. Dempster, N. J., Ceresa, C. D., Aitken, E., & Kingsmore, D. (2013). Outcomes following renal transplantation in older people: A retrospective cohort study. *BMC Geriatrics*, 13(1), 79. <https://doi.org/10.1186/1471-2318-13-79>
 7. Dreyer, G. J., & de Fijter, J. W. (n.d.).
 8. Faravardeh, A., Eickhoff, M., Jackson, S., Spong, R., Kukla, A., Issa, N., Matas, A. J., & Ibrahim, H. N. (2013). Predictors of graft failure and death in elderly kidney transplant recipients. *Transplantation*, 96(12), 1089–1096.
 9. Heldal, K., Hartmann, A., Lønning, K., Leivestad, T., Reisæter, A. V., Line, P.-D., Holdaas, H., & Midtvedt, K. (2017). Should patients older than 65 years be offered a second kidney transplant? *BMC Nephrology*, 18(1), 13. <https://doi.org/10.1186/s12882-016-0426-0>
 10. Huang, E., Segev, D. L., & Rabb, H. (2009). Kidney transplantation in the elderly. *Seminars in Nephrology*, 29(6), 621–635. <https://doi.org/10.1016/j.semnephrol.2009.07.011>
 11. Katvan, E., Doron, I., Ashkenazi, T., Boas, H., Carmiel-Haggai, M., Elhalel, M. D., Shnoor, B., & Lavee, J. (2017). Age limitation for organ transplantation: The Israeli example. *Age and Ageing*, 46(1), 8–10. <https://doi.org/10.1093/ageing/afw162>
 12. Legeai, C., Andrianasolo, R. M., Moranne, O., Snanoudj, R., Hourmant, M., Bauwens, M., Soares, J., Jacquelinet, C., Couchoud, C., & Macher, M.-A. (2018). Benefits of kidney transplantation for a national cohort of patients aged 70 years and older starting renal replacement therapy. *American Journal of Transplantation*, 18(11), 2695–2707. <https://doi.org/10.1111/ajt.15110>
 13. Lønning, K., Midtvedt, K., Leivestad, T., Reisæter, A. V., Line, P.-D., Hartmann, A., & Heldal, K. (2016). Are Octogenarians With End-Stage Renal Disease Candidates for Renal Transplantation? *Transplantation*, 100(12), 2705–2709. <https://doi.org/10.1097/TP.0000000000001363>
 14. Mehta, J., Ndubueze, O., Tatum, D., Jeon, H., Paramesh, A., Killackey, M., & Vijay, A. (2023). Kidney Transplant Outcomes in Recipients Over the Age of 70. *Cureus*, 15(1), e34021. <https://doi.org/10.7759/cureus.34021>
 15. Oniscu, G. C., Brown, H., & Forsythe, J. L. (2004). How Old is Old for Transplantation? *American Journal of Transplantation*, 4(12), 2067–2074. <https://doi.org/10.1111/j.1600-6143.2004.00622.x>
 16. Qiu, Y., Liu, J., Jiang, Y., Song, T., Huang, Z., Fan, Y., Wang, X., & Lin, T. (2020). Effect of donor kidney morphology parameters on the prognosis in living kidney transplantation recipients. 2020, 9(5), 1957–1966.
 17. Rana, A., Murthy, B., Pallister, Z., Kueht, M., Cotton, R., Galvan, N. T. N., Etheridge, W., Liu, H., Goss, J., & O'Mahony, C. (2017). Profiling risk for acute rejection in kidney transplantation: Recipient age is a robust risk factor. *Journal of Nephrology*, 30, 859–868.
 18. Rao, P. S., Merion, R. M., Ashby, V. B., Port, F. K., Wolfe, R. A., & Kayler, L. K. (2007). Renal transplantation in elderly patients older than 70 years of age: Results from the Scientific Registry of Transplant Recipients. *Transplantation*, 83(8), 1069–1074.

Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy in Myanmar!

19. Waiser, J., Budde, K., Böhler, T., & Neumayer, H.-H. (1997). The influence of age on outcome after renal transplantation. *Geriatric Nephrology and Urology*, 7(3),137–146. <https://doi.org/10.1023/A:1008263727499>.
20. Wolfe, R. A., Ashby, V. B., Milford, E. L., Ojo, A. O., Ettenger, R. E., Agodoa, L. Y. C., Held, P. J., & Port, F. K. (1999). Comparison of Mortality in All Patients on Dialysis, Patients on Dialysis Awaiting Transplantation, and Recipients of a First Cadaveric Transplant. *New England Journal of Medicine*, 341(23),1725–1730. <https://doi.org/10.1056/NEJM199912023412303>
21. Yemini, R., Rahamimov, R., Ghinea, R., & Mor, E. (2021). Long-Term Results of Kidney

Transplantation in the Elderly: Comparison between Different Donor Settings. *Journal of Clinical Medicine*, 10(22). <https://doi.org/10.3390/jcm10225308>

Cite this: Pyar, K. P. ., Hla, S. A., Shwe, W. K., Aung, Z. H., Myint, T. T., Win, T., Kyaw, A. P., Htet, A. Z., Lwin, K. T. Y., Maung, L. M., Hein, Y. M., Maung, M. M., Aung, Z. Z., Khine, A. K., Oo, T. T., & Ko, M. K. (2023). Successful Living Donor Kidney Transplantation in 72-Years-Old Women with Diabetes Mellitus: Beyond the Age of Life Expectancy In Myanmar!. *Journal of Medical Research and Health Sciences*, 6(10), 2771–2777. <https://doi.org/10.52845/JMRHS/2023-6-10-2>