International Journal of Dentistry Research 2020; 5(3): 141-143

International Journal of Dentistry Research

Review Article

ISSN: 2581-3218
IJDR 2020; 5(3): 141-143
Received: 03-10-2020
Accepted: 17-12-2020

www.dentistryscience.com

Organ Transplantation and Dental Aspects- The Road ahead

Nithyaja B J[1], Kiran Kumar N[2], Hariprasad L[3], Anjum Afshan[4], Priya Mariam Thomas[3], Arun Kumar R V[3]

1 *Jayanagar Government Hospital, Jayanagar, Bangalore-560041, Karnataka, India*

2 *Professor and HOD, Department of Orthodontics, Government Dental College and Research Institute, Bangalore-560002, Karnataka, India*

3 *Post graduate Student, Department of Orthodontics, Government Dental College and Research Institute, Bangalore-560002, Karnataka, India*

4 *Prosthodontics and Implantology, MS Ramaiah Dental College, Bengaluru-560054, Karnataka, India*

Abstract

Organs fail to fulfil their need in the body due to different etiological factors. Hence, demand for the transplantation of a viable organ arises. Oral cavity is capable of projecting the faults of an improperly functioning organ. Dentists are more likely to encounter such cases in their daily practice. However, such cases go unreported due to inadequate knowledge in this field. This review is formatted by collecting all available literature on PubMed, Google Scholar and Google search engines to showcase the role of dentists in the management of patients undergoing Organ Transplantation. This review enlightens on how Dentists can better equip themselves to tackle such cases, when they come across one. This review also projects on the infection foci arising from the oral cavity disturbing the systemic organs and the treatment protocols for managing it.

Keywords: Organ Transplantation, Pretransplantation Dental Care, Post Transplantation Dental Care.

***Corresponding author:**
Dr. Hariprasad L
Post graduate Student, Department of Orthodontics, Government Dental College and Research Institute, Bangalore-560002, Karnataka, India
Email:
hariprasadl6789@gmail.com

INTRODUCTION

The enhanced understanding of immune response and immunosuppressant drugs led to the breakthrough discovery of organ transplantation. The current success of organ transplantation is due to the prolonged research and extensive studies dated as back as 1000BC by Sushruta. With the invent of immunosuppressant drugs replacement of failing organs like lungs, liver, kidney and heart were made possible thereby improving the quality of life of the patients giving them a ray of hope [1].

According to Soylu et al 82.6% got their organs from living donors. The survival rate of the grafts were estimated for 1 year and 5 year. One-year and 5-year graft survival rates were 87.5% and 78.3% for renal transplant [2]. The survival rates were 75.5%, 67.6%, and 61.8% at 1 year, 3 years, and 5 years, separately for lungs transplants [3].

A hand in hand coordination of various specialities is required for a successful organ transplantation. The "Multiprofessional Residency in Organ Transplantation (MROT)" was formed up in 2011 and the basic ideology is to unite specialists from various regions of healthcare to deliver quality consideration during the procedure of donation and transplantation [4].

The dental speciality plays a major role during the pre transplantation and post transplantation aspects. The transplantation protocols expect active participation of dentists in the treatment of such patients. The risk of oral infections are high in patients undergoing organ transplant due to the state of immunosuppression.

Oral foci of infection often play a crucial role in systemic manifestations of disease. The foci can emerge from either Apices of the teeth (Granuloma) or from the supporting structures of the tooth, for example, gingiva, cementum or alveolar bone. Such foci of disease can prompt spread of harmful pathogens to different organs of the body through blood or lymphatic pathway [5]. This oral foci of infection if not properly diagnosed can progress very rapidly and can cause major discomfort and pain to the patients.

This review aims to outline the pretransplantation and post transplantation management aspects of such patients. This provides an insight into the dental management of such patients. The significance of proper

dental care is highlighted in this review.

Pretransplantation Dental Care:

Before any transplantation procedures it is often strategized for the patient to undergo a routine oral examination followed by the needful treatment. Although the scientific literature addresses various aspects and parameters related to organ transplantation, dental care (pre transplantation and post transplantation) is seldom addressed. Dental care before transplantation has to be considered as an "essential medical service" to compact the possible complications. Surveys suggest that there is a strong recommendation among the practitioners for pre and post transplantation dental care of heart, kidney and liver patients. However the information regarding the oral health status before and after transplantation is not recorded in the transplant centres [6]. Ziebolz et al in the cross sectional study recorded transplant patients often presented with poor oral health status. Kauffels et al observed higher dental caries index in both pre and post transplantation patients [7].

Studies on pre transplantation patients often show there is increased need for the care of oral health. Infections of fungal etiology are often shown to affect these patients due to inappropriate pretransplantation dental care. Periodontal status of these patients are also compromised which requires special attention.

The primary step in pre transplantation cases is the education and motivation of the patient. An interdisciplinary collaboration between the physician and dentist should prevail. The donor as well as the recipient should be explained about the significance of oral health. Early dental rehabilitation of these patients helps to reduce the future burden. The patient should be well informed about the oral aspects and potential complications that may rise in the future due to immunosuppression. This may motivate them to maintain good oral hygiene and periodontal health. the possibility of opportunistic infections in the oral cavity like that of candida albicans should be well informed.

According to Guggenheimer et al the change in lifestyles (physically and emotionally) and the economical burden to these patients might be a possible reason for the reduced interest in oral health status [8]. Significant consideration ought to be given to patients' past experiences and attitude toward dental treatment and their history of oral hygiene maintenance. Different factors that get into the decision-making process should incorporate the ability of the patient to endure dental strategies, the level of clinical insecurity, and the time imperatives directed by the accessibility of the contributor organ. After the transplantation, circumstances of budgetary exigency grow, any considerations with respect to the transplant would be given need over dental consideration [1].

The rejection of one organ will for the most part lead to a course of intricacies. For instance, end-stage renal infection is regularly joined by ineffectively controlled diabetes and cardiovascular problems. End-stage liver or kidney disease may prompt various metabolic and coagulation issues that make especially perplexing difficulties to dental treatment.

Guidelines for dental treatment:

- When a patient arrives at the dentist, it is the prime duty of the dentist to have a brief discussion with the respective physician overlooking the transplantation surgery. This is to look into the possible complication and risk factors while treating these patients. The consent by the physician often serves as valuable documentation in medicolegal scenarios. The pretreatment tests that have to be performed should be discussed with the physician in prior.

- Pretreatment tests:Regardless of the treatment plan, pre operative assessment of coagulopathy is mandatory in renal and liver transplant patients. Complete blood count, prothrombin time (PT)/ international normalized ratio (INR), and partial thromboplastin time (PTT) are evaluated. In addition Electrolytes and liver function tests (LFTs) are assessed.The rise in amino transaminases, alkaline phosphatase, prothrombin time and serum bilirubin are indicative of propelled phase of liver damage [9,10].

- Clinical Evaluation: The primary goal of clinical evaluation is to identify and remove potential sources of infection since its exacerbation pre surgically can result in the delay of transplantation. Caries and periodontal disease present with peri apical lesions are the most prevalent conditions among both pretransplant and transplant recipients hence, imaging should be done for evaluation of dental and bone conditions of these patients [7]. Removal of oral foci of infection includes management of all active dental diseases as well as elimination of the rich source of potentially pathologic chronic infectious entities.

- After thorough oral examination of the patient, they are subjected to oral prophylaxis to eliminate the oral foci of infection. These foci such as the dental plaque and calculus can irritate the tissues and can lead to fully fledged gingival infections. During the immunosuppressive state the course of the disease can take a devastating turn leading to an array of various clinical presentations.

Dental Procedures To Be Performed: The proposed protocol indicates restorations in viable teeth, plaque control through prophylaxis, hygiene instructions, extraction of nonviable teeth, denture adjustments and antibacterial mouth rinses are prescribed for daily use.

Post Transplantation Dental Care

- Post transplantation of any organ the patient is bound to a new lifestyle absolutely different from what they previously dealt with. Patients as well their kin have to be well oriented to these changes.

- Post-surgical phases are usually monitored by the transplantation centres until the stabilization of graft. Once the patient is stabilised the follow up care is usually provided by the physician. From this phase post operative dental care carries a significant role for the well being of the patient. The challenge faced upon by the dental practitioners is of paramount significance. They are often confronted by numerous issues such as metabolic derangements, including electrolyte disturbances and diabetes, which may be caused by the immunosuppressive drugs post transplantation.

Postoperative immunosuppression

The medications following organ transplant affect the T lymphocytes regulating the cytokines in the body. Immunosuppressants such as corticosteroids and azathioprine in high doses are associated with various adverse effect such as neutropenia.The recent drugs such as cyclosporine and include drugs that inhibit calcineurin and is associated with less adverse effects [11].

Pain management (Post procedural analgesia):

Most of the analgesics enter the hepatic portal. Any underlying liver or kidney disease alter the pharmacokinetics. Hence while prescribing any analgesics for dental pain management utmost care has to be undertaken especially related to the dosage and intervals of drugs intake. NSAIDS and antibiotic prescribed by the dentist is often metabolised through the renal route. Hence while prescribing analgesics renal function has also to be kept in mind. The possibility of gastro intestinal bleeding and renal complications in patients with cirrhosis NSAIDs are generally contraindicated [12]. NSAIDs also are said to potentiate the nephrotoxic effects of the immunosuppressants. 50 mg of tramadol every 12 h is the drug of choice in case of liver insufficiency

as stated by the United States Food and Drug Administration. Narcotics may cause hepatic encephalopathy and are contraindicated [13]. Acetaminophen 2g per day is relatively safe in many liver conditions, hence should be the drug of choice for pain management [14]. Transplant recipients should be kept under constant follow up for the rest of their lives. A number of protocols evaluating the outcomes of treatment are being followed for a large number of patients and this will provide a substantial patient database.

Dental Complications of immunosuppression:

Hietala et al in a study on liver transplant patients reported higher incidence of xerostomia and taste dysfunction associated with hyposalivation, lichenoid dysphagia,lesions such as leukoplakias, and ulcers compared with the control groups [15].

Bryan et al in the retrospective study however noticed no significant difference in post-transplant mortality, infection and graft patients who did and did not undergo preoperative dental treatment [16].

The most common cause of mortality post- transplantation is due to bacterial. Viral, fungal cytomegalovirus infection, gingival hyperplasia (GH), and malignant oral lesions due to immunosuppression [17]. Immunosuppression is done at its maximum immediately post transplantation hence, related to the greatest risk of infection [18].

CONCLUSION

The need for the knowledge about oral care of a transplant patient is very important for a dentist. Dental management of patients before and after the transplantation process is very important. Every possible foci of infection should be diagnosed appropriately and treated. And patients' medical condition must be kept in mind while diagnosing, planning and performing the treatment. Both pre-transplant and post-transplant patients require the oral treatment to assure their wellbeing.

Conflicts of Interest

The authors declare no conflict of interest.

REFERENCES

1. Guggenheimer J, Eghtesad B, Stock DJ. Dental management of the (solid) organ transplant patient. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2003;95(4):383-9.
2. Soylu H, Oruc M, Demirkol OK, Saygili ES, Ataman R, Altiparmak MR, Pekmezci S, Seyahi N. Survival of renal transplant patients: data from a tertiary care center in Turkey. InTransplantation proceedings 2015 Mar 1 (Vol. 47, No. 2, pp. 348-353). Elsevier.
3. Jo KW, Hong SB, Kim DK, Jung SH, Kim HR, Choi SH et al. Long-Term Outcomes of Adult Lung Transplantation Recipients: A Single-Center Experience in South Korea. Tuberc Respir Dis 2019;82(4):348-56.
4. Nascimento SV, Gonzalez AM, Roza BA, Pimentel CF, Schirmer J, Mucci S, Abranches DC. Development of Routine Dental Care for Liver Transplant Outpatients. InTransplantation proceedings 2018 Apr 1 (Vol. 50, No. 3, pp. 779-783). Elsevier.
5. Yamalik N, Avcikurt UF, Caglayan F, Eratalay K. The importance of oral foci of infection in renal transplantation. Aust Dent J. 1993 Apr;38(2):108-13.
6. Ziebolz D, Hrasky V, Goralczyk A et al. Dental care and oral health in solid organ transplant recipients: a single center crosssectional study and survey of German transplant centers. Transpl Int 2011 24: 1179–1188.
7. Álamo SM, Esteve CG, Pérez MS. Dental considerations for the patient with renal disease. J Clin Exp Dent. 2011;3(2):112-9.
8. Guggenheimer J, Eghtesad B, Close JM et al. Dental health status of liver transplant candidates. Liver Transpl 2007 13: 280– 286.
9. Nazhvani AD, Haddadi P, Badiee P, Malekhoseini SA, Jafarian H. Antifungal effects of common mouthwashes on Candida strains colonized in the oral cavities of liver transplant recipients in South Iran in 2014. Hepatitis Monthly. 2016 Jan;16(1).
10. Radmand R, Schilsky M, Jakab S, Khalaf M, Falace DA. Pre-liver transplant protocols in dentistry. Oral surgery, oral medicine, oral pathology and oral radiology. 2013 Apr 1;115(4):426-30.
11. Radomski MW, Palmer RM, Moncada S. Endogenous nitric oxide inhibits human platelet adhesion to vascular endothelium. Lancet. 1987;2:1057-1058.
12. Kim JH, Perfect JR. Infection and cyclosporine. Reviews of infectious diseases. 1989 Sep 1;11(5):677-90.
13. Jover Cervero A, Bagan JV, Jimenez Soriano Y, Poveda Roda R. Dental management in renal failure: patients on dialysis. Med Oral Patol Oral Cir Bucal 2008;13:E419-26.
14. Larson AM, Polson J, Fontana RJ, Davern TJ, Lalani E, Hynan LS, Reisch JS, Schiødt FV, Ostapowicz G, Shakil AO, Lee WM. Acetaminophen-induced acute liver failure: results of a United States multicenter, prospective study. Hepatology. 2005 Dec;42(6):1364-72
15. Helenius-Hietala J, Ruokonen H, Grönroos L, Rissanen H, Vehkalahti M, Suominen L, Isoniemi H, Meurman JH. OI0230 Oral mucosal lesions in liver transplant recipients and controls. Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology. 2014 May 1;117(5):e363.
16. Meyer U, Weingart D, Deng MC, Scheld HH, Joos U. Heart transplants–assessment of dental procedures. Clinical oral investigations. 1999 Jul 1;3(2):79-83.
17. Smart FW, Naftel DC, Costanzo MR, Levine TB, Pelletier GB, Yancy Jr CW et al. Risk factors for early, cumulative, and fatal infections after heart transplantation: a multiinstitutional study. The Journal of heart and lung transplantation: the official publication of the International Society for Heart Transplantation. 1996;15(4):329-41.
18. Weir MR, Anderson L, Fink JC, Gabregiorgish K, Schweitzer EJ, Hoehn-Saric E, Klassen DK, Cangro CB, Johnson LB, Kuo PC, Lim JY. A novel approach to the treatment of chronic allograft nephropathy 1. Transplantation. 1997;64(12):1706-10.