Society for Heart Failure and Transplantation

SOCIETY FOR HEART FAILURE AND TRANSPLANTATION'S

THE REVIVAL

Promoting Academics to Improve Clinical Outcomes.

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EDITOR'S NOTE

Dr. Manoj Durairaj
Heart Transplant Surgeon
MS,MCh.(AIIMS, New Delhi), FACC. Director, Marian Cardiac Centre and Research Foundation. Program Director Department of Heart and Lung Transplantation, Sahyadri Hospitals, Pune.

Dear Colleagues,

I consider it as my privilege and honor to be the Editor of The Society for Heart Failure and Transplantation's Newsletter "The Revival". The focus of this Newsletter is **"To Promote the latest in current knowledge and practice in the field of Heart Failure and Transplantation and thereby improve clinical outcomes."**

I welcome Dr. Talha Meeran as the Sub Editor. It will be the Editorial team's endeavour to publish articles from Indian clinicians so as to develop and nurture academics and instill the spark of writing and projecting their experience. We have chosen the theme of Paediatric Heart Transplantation for this month and we will run three issues of "The Revival" dedicated to this subject. We welcome your articles. Please feel to write to us with suggestions and any out of the box ideas.

- Dr. Manoj Durairaj
Editor "The Revival"

SUB EDITOR

Dr. Talha Meeran
MBBS, MD, FACC, Consultant Cardiologist, Dept of Advanced Cardiac Sciences and Cardiac Transplant, Sir HN Reliance Foundation Hospital, Mumbai.

Dear Colleagues,

It gives me immense pleasure to be part of the editorial team of The Society for Heart Failure and Transplantation's Newsletter "The Revival". Under the leadership of the society president, Dr. V. Nandakumar and using the creative talents of our editor, Dr. Manoj Durairaj, our aim is to provide a platform for all academic discussions pertaining to this rapidly expanding field of advanced heart failure, cardiac and lung transplants.

The newsletter will play a vital role in bringing our large academic community together by engaging each one through its academic content and updates pertaining to the society's calendar events.

Sincerely,
Dr. Talha Meeran
Sub Editor "The Revival"

PRESIDENTIAL MESSAGE

Prof. (Dr) V. Nandakumar
Director & Chief, Division of Cardio Vascular/ Thoracic Surgery & Cardiac Transplantation, Metromed International Cardiac Centre, Calicut, Kerala.

Dear Colleagues,

Wish you all a Happy New Year.

Society for Heart Failure and Transplantation(SfHFT) is bringing out a news letter 'The Revival' indicating revival of heart failure patients. This is started with the idea of providing a platform for the members to present important aspects of heart failure and transplantation, thereby helping to raise the standards in the management of these patients and also to make the community aware of the Society's activities in this regard. As you are aware, heart failure is a major health problem globally. Worldwide prevalence of heart failure is 64.34million which indicates the gravity of the situation. Lot of improvements have been achieved by the use of newer drugs and newer implantable devices, but there are limitations. Timely treatment can prevent irreversible damage. For end stage cardiac failure, cardiac transplantation is still the gold standard.

Now there are over 70 centres in India doing heart transplantation. Over 1000 heart transplantions have been done in Inda. Last year we saw a drastic decline in the number of transplants because of the effects of Covid 19 pandemic. With the present vaccination campaign, hopefully this pandemic will be under control in the near future and we should be able to get the numbers up again.

With best wishes for a bright future.

- Prof. (Dr) V. Nandakumar
President

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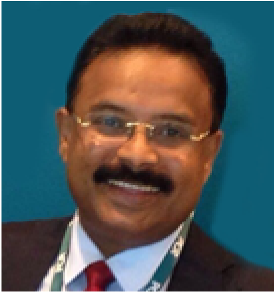
Special thanks to Dr. Swati Garekar for authoring this month's article.

Designed by Maithili Kulkarni

SECRETARY'S NOTE

SFHFT ACTIVITIES 2020



Dr. Jabir Abdullakutty
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The year 2020 was a year of significant losses. The COVID pandemic produced an unexpected, unimaginable loss of human life, health, and extreme exhaustion of human resources, which was uniform globally irrespective of the nations' financial status. Survival was the biggest challenge in 2020, and we could achieve it. We all look forward to 2021 with great hope and expectations. Let the new year bring peace, prosperity, and happiness to all of humankind.

We were forced to cancel the annual conference due to the COVID pandemic. However, we could conduct three excellent academic programs in the year 2020 on the digital platform. Dr. Talha Meeran organized a webinar on May 5, 2020. The topic was Heart failure and cardiac surgery in COVID 19 hotspots and ways to resume normalcy. Dr. Guiseppe Galati, Consultant cardiologist in Heart failure and cardiomyopathies, San Raffaele Hospital, Milan and Dr. Vinayak Bapat, Director, Transcatheter valve therapy in the cardiac surgery section of Columbia university medical center, New York, were the speakers. Dr. Ajithkumar V K, Dr. Anvay Mulay, and Dr. Talha Meeran were the moderators. The webinar was well attended and gave us useful insights regarding the HF management during the initial onslaught of the COVIDpandemic and the lockdown.

Dr. Jose Chacko Periyappuram organized a three-day webinar on "Organ Transplantation on the move " from August 21 to 23. Dr. Vasanthi Ramesh, Director NOTTO, inaugurated the webinar. Dr. Mandeep Mehra, Dr. Jayan Parameswar, Dr. Riyad Terazi, Dr. Alicia Perez, Dr. Maria Paula, Dr. Julie Whitney, Dr. Sunil Shroff, Dr. K R Balakrishnan, Dr. Mohammed Rela, Dr. Anilkumar, Dr. Sandeep Seth, Dr. A G K Gokhale, Dr. Bhagirath R, Mr. Noble Gracious and Dr. Arti Gokhale were the faculty. The webinars discussed the current challenges of organ transplantation and solutions. Dr. Kumuth Dhithal was the moderator who played a vital role in the scientific sessions' successful running. The seminar was attended by all organ transplant stakeholders and was endorsed by ISOT, HFAI, INSHLT, HFF, CSI, and IACTS.

Dr. Manoj Durairaj organized the mid-term meeting on 16,17,18 October as a webinar on mechanical cardiac support with INSHLT as the partner. IACTS, HFF, and HFAI endorsed it. Dr. Ivan Netuka, Dr. Fransisco Arabia, Dr. Fabrizio De Rita, Dr. Scott Sylvestri, Dr. Brian Pinto, Dr. Ranjit John, Dr. K R Balakrishnan, Dr. Shanmugha Sundaram, Dr. Bhagirath Reghuraman, Dr. Suresh Rao, and Dr. Keyur Shah were the speakers for the webinar. The webinar was well attended and appreciated.

Apart from the academics, the Society could extend a helping arm to the COVID forefront fighters in Mumbai and Pune by providing N 95 masks in bulk. SfHFT could support its members also with N 95 masks.

I thank President Dr. V. Nandakumar, Scientific committee chairpersons Dr. V K Ajithkumar, Dr. Julius Punnen, president-elect Dr. Rony Mathew, Dr. Jose Chacko Periyappuram and the rest of the executive committee for their enormous contribution to the society activities.

I am sure that we will be able to do much better in 2021.

The Newsletter " The Revival" is the new endeavour of SfHFT in the new year. It is made possible by the tremendous efforts of Dr. Manoj Durairaj who is the editor and Dr. Talha Meeran, who is the sub editor. It is an Incredible work and on behalf of SfHFT, I congratulate them and place on record our appreciation.

- Dr. Jabir Abdullakutty,
  Secretary

PRE HEART TRANSPLANT WORK UP AND OUTPATIENT POST OP CARE FOR THE PEDIATRIC HEART TRANSPLANT PATIENT

Dr Swati Garekar is a pediatric cardiologist practising at Fortis hospital Mulund Mumbai.
She completed her MBBS from Seth GS Medical college and KEM Hospital Mumbai after which she did her MD pediatrics at the Children's Hospital of Michigan, Detroit. She went on to complete her 3 year pediatric cardiac fellowship at the same institution. She is interested in echocardiography, fetal echo, 3D printing of hearts, and heart failure/transplants.

INTRODUCTION:

Annually, around 5000 heart transplants occur around the world, of which 500 are pediatric ones. The number of heart transplants being performed in India is increasing and is fast becoming a practical option for our patients. This is true for the pediatric world as well. There is additional responsibility on the pediatric cardiac team as their patient has a much longer lifespan to be protected part of which is in a growing/ evolving stage. The Indian scenario continues to have financial challenges apart from product (eg. appropriate lab tests, medications) and logistic (transport of organ) issues.

The following is a limited enumeration of outpatient evaluation of the pre and post heart transplant pediatric patient.

PRE TRANSPLANT WORK UP:

1. The primary responsibility of the team is to ensure that any treatable causes of heart failure have been detected and treated.

Ensure that the patient has been investigated thoroughly.

Some common (and potentially) treatable causes of pediatric heart failure are ALCAPA, LV outflow tract obstructions, systemic hypertension (secondary to eg. Pheochromocytoma), calcium and Vit D deficiency, certain SVTs masquerading as sinus tachycardias, Takayasu arteritis, and constrictive pericarditis.

The patient should also not have a contraindication to transplant: elevated non-responsive PVR, CHD with hypoplastic pulmonary arteries, active malignancy or associated with poor prognosis, advanced multi-organ failure, severe extracardiac malformations (syndromes etc) with poor quality of life and medical non-compliance issues in family.

2. Counselling session with family. This should include natural history of the condition and post heart transplant scenario for the patient. The mental and financial resources required by the family post transplant also needs to be discussed.

3. Judging the severity of heart failure.

a. Growth percentiles serially followed

b. Quality of life. (playing is everything for a child!)

c. Hospitalizations for heart failure or home inodilator therapy.

d. Detailed echocardiogram

e. 12 lead ECG

f. Diagnostic cardiac catheterization with calculation of cardiac output and PVRi and response to or oxygen, sildenafil or iNO if transpulmonary gradient is high. Cardiac cath is recommended for all patients especially patients with non-DCM findings in the echo evaluation. Moderate persistent PH in a DCM patient should also warrant a cardiac cath.

g. Serial values of NT pro BNP (or BNP)

h. Serum ST-2 level may be considered.

4. End organ health assessment

a. CBC with differential

b. BUN, Creatinine, electrolytes

c. Liver function tests

d. Lipid profile

e. Chest XRay

f. Urine routine, microscopy and urine protein/creatinine ratio

g. Abdominal ultrasound

h. Additional imaging if pt has CHD

5. Infection surveillance (serology needed yearly if on the transplant waitlist for a long time). If child receives a live attenuated vaccine then they need a 4wk waiting period before being placed on the waiting list.

a. HIV

b. HBS Ag

c. HCV Ab

d. HSV IgG and IgM

e. EBV IgG and IgM

f. CMV Ig G and IgM

g. Varicella IgG

h. Measles, Mumps, Rubella IgG

i. Mantoux test

6. Labs specific for Transplant

a. Blood grp

b. Panel Reactive Antibody (PRA)

c. Lymphocyte immunotyping; subtyping

d. Chest XR less than 6mo old film

e. Echo less than 3 months old report

f. ECG less than 3 months old tracing

g. Updated Height and Weight every 3 months

POST TRANSPLANT OUT-PATIENT CARE OF THE CHILD

1. The family must be asked to survey their home to ensure that cleanliness. The walls/ceilings should be inspected for damp spots. An isolated corner/room can be devoted for the child.

2. No visitors for 3 months

3. All family members should receive age appropriate vaccines; preferably non live one. If younger children in the house get the live vaccine (eg. MMR), then appropriate contact precautions should be taken to isolate the heart transplant patient.

4. Diet:

a. Avoid eating food prepared in hotels, street food etc as far as possible and especially in the first year post transplant.

b. Wash fruits and vegetables thoroughly before using. Avoid raw veggies including sprouts for the first 3 months. Avoid undercooked meat, unpasteurized milk and juice prepared outside the house.

c. No intake of orange (eg Nagpur orange) as it interferes with Tacrolimus. Grapefruit is also to be avoided. (Grapefruit is distinct from grape).

d. Follow a healthy diet for the whole family. This means whole grains, fruits and vegetables and less of sugar, salt, oil and packaged food for the whole family.

5. Purchase a weighing scale for home use. Record weight weekly initially and then monthly.

6. Strict adherence to OPD appointments.

7. Inform if vomiting after tacrolimus/mycophenolate dose; unexplained fever; diarrhea, weight change

8. No immunization for 6 months post transplant.

9. No live attenuated vaccines to be given at-all post transplant. The list includes measles, mumps, rubella, varicella, oral rotavirus, nasal flu vaccine, oral typhoid vaccine, BCG, oral polio.

10. Annual flu (non live) vaccine is recommended.

11. May return to school 3 months post transplant. Plan must be individualized based on the local situation.

12. Endomyocardial Biopsy: 1 month post transplant and then annually. More frequent biopsies may be required.

13. Coronary angiography for detection of coronary allograft vasculopathy (CAV). IVUS /OCT are better suited for CAV detection compared to coronary angiography alone but cost is an issue. Left and right heart catheterization with recording of hemodynamics at the time of biopsy.
If a coronary angiogram was not done on the donor heart (>40years old), an angiography maybe done along with the 1month endomyocardial biopsy.

14. Standard Medications

a. **Tacrolimus:**

i. Child to eat and drink nothing for 1 hour before and after tacrolimus. Current recommendations mention no need for NBM status pre and post.

ii. Usual dose is 0.1mg/kg/day divided into 2 doses PO

iii. Trough levels (mcg/L) to be maintained post transplant:

1. 0-6months:10-12
2. 7mo-1yr:8-10
3. 1yr to 36 months post transplant: 6-8
4. >3yrs post transplant: 5-7

b. **Mycophenolate:**

i. Dose is 20mg/kg/day divided into 2 doses PO

ii. Watch out for side effects: WBC count and diarrhoea

c. **Prednisone**

i. Dose is 5mg/day or 0.1mg/kg/day

ii. To be continued for 6months to 1 year if rejection free (wean off)

d. **Valgancyclovir for 3months for CMV prophylaxis.** Dose : BSA x Creat clearance x 7. (Creatinine clearance by Schwartz formula; max value to be taken as 150ml/min/1.73m2). The tablet strength is 450mg and in general, the dose is 1 tablet OD ; to be adjusted for renal impairment if required.

e. **Sulfamethoxazole-Trimethoprim (Bactrim)** for 6 months for Pneumocystis and Toxoplasmosis prophylaxis. Dose 80mg TMP (+400mg sulphamethoxazole) component tablet once a day. BSA adjusted dose: 150mg/m2 of TMP component per day. Some protocols give it thrice a week only.

f. **Statin.** Rosuvastatin may be used >10yr age. 5-10mg q HS. The practice of starting a statin is not uniform for all centres.

15. Pediatric cardiology Clinic visit

a. Every month for the 1st 3 months and then every 3 months for the first year. Every 6months for the 2nd year and then annually or more frequently as reqd. This visit includes height, weight, BP, pulse oximetry check, complete physical exam, check list for side effects of medications and PTLD surveillance (weight loss, fever without focus, "tonsilitis").

b. Echocardiogram: same schedule as above, with emphasis on ventricular systolic and diastolic function and PA pressure evaluation

c. ECG: same schedule as above

d. Holter monitor annual; if CAV present

e. Exercise stress test annual if CAV present

16. Blood tests

a. Monthly Tac level for the first 2 years; then 3 monthly or more frequently as indicated.

b. CBC every month for first 6months and then 3 monthly to 6monthly thereafter.

c. BUN, Cr similar to CBC

d. CMV IgG titre if negative pre op. If positive, then CMV PCR after 6months.

e. EBV IgG titre every 3 months if negative pre op. EBV PCR every 3 months for the first year esp if asymptomatic increase in titre. Serum LDH levels may be added.

f. Creatine Kinase (CK) level at 6months, if on statin.

g. Annual: CBC, Lipid profile, CMV IgG if preop negative; CMV PCR if pre op positive, EBV IgG if preop negative, EBV PCR if preop positive; varicella IgG, Liver function tests, BUN, Creatinine with GFR calculation, lytes, serum Glucose, calcium, Vit D 25(OH) level, serum calcium, HbA1c, iron studies, NT pro BNP, Urine routine and microscopic and protein/creatinine ratio, DXA scan for bone density (may make once in 2 years if normal).

CONCLUSION:

1. Pediatric heart transplant is a viable option for end stage pediatric heart failure in India.
2. Pre operative work up begins with ruling out treatable causes of heart failure
3. Further tests are used to determine extent of heart failure and timing of listing for heart transplant in addition to some specific pretransplant labs
4. Pre operative counselling (regarding their expectation from the procedure) of the family and the child is essential.
5. The first 1 year post transplant is most stressful for the medical team and the family as it involves extra care and surveillance.
6. Basic post operative medications are Tacrolimus and Mycophenolate currently. Modifications are made for individual patients.
7. Surveillance post-transplant revolves around detecting drug induced organ dysfunction, new infection, tumour detection and signs of rejection and coronary allograft vasculopathy.
8. Lifestyle should be focused on returning to a normal life with a focus on healthy diet, daily exercise and strict compliance with medications and tests.

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