Role of Beta-Blockers Following Percutaneous Balloon Pulmonary Valvuloplasty

Thesis

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List of Contents

Title	Page No.
List of Tables	5
List of Figures	7
List of Abbreviations	10
Introduction	1
Aim of the Work	14
Review of Literature	
▪ Pulmonary Stenosis	15
▪ Balloon Pulmonary Valvuloplasty	32
▪ Infundibular Hypertrophy and Beta-Blockers	45
Patients and Methods	52
Results	66
Discussion	84
Limitations and Recommendations	92
Conclusion	93
Summary	94
References	96
Arabic Summary	—

List of Tables

Table No.	Title	Page No.
Table (1):	Overview of the pharmacological and pharmacokinetic characteristics of the β-blockers	46
Table (2):	Demographic and anthropometric data for the Placebo arm and the BB arm	66
Table (3):	Procedural data for the Placebo arm and the BB arm	68
Table (4):	Comparison between placebo arm and BB arm regarding functional capacity and echocardiographic data at 24 hours post-BPV	69
Table (5):	A Comparison between placebo arm and BB arm regarding functional capacity and echocardiographic data at 1 month post-BPV	71
Table (6):	A comparison regarding functional capacity and echocardiographic data obtained at 24 hours and at 1 month post-BPV for the placebo arm.	73
Table (7):	A comparison regarding functional capacity and echocardiographic data obtained at 24 hours and at 1 month post-BPV for the BB arm.	75
Table (8):	A comparison between the two study arms regarding the percent change between FC and echocardiographic data obtained at 24 hours and at 1 month after BPV	77
Table (9):	Correlation of age and B/A ratio with percentage of change in FC and echocardiographic data in placebo Arm.	80
Table (10):	Correlation of participant sex with the percentage of change in FC and echocardiographic data in placebo Arm.	81

List of Tables Cont...

Table No.	Title	Page No.
Table (11):	Correlation of age and B/A ratio with percentage of change in FC and echocardiographic data in BB Arm.	82
Table (12):	Correlation of participant sex with the percentage of change in FC and echocardiographic data in BB Arm.	83

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Drawing of pulmonary stenosis with atrial septal defect and left to right shunt well depicting the case of a 16-year-old girl reported by Morgagni	15
Figure (2):	**(a)** Dome-shaped pulmonary valve seen from the arterial aspect. **(b)** Dome-shaped valve with deep sinuses (s) opened to show the plication of the arterial wall at the sinutubular junction. **(c)** Dome-shaped valve with shallow sinuses (s)	17
Figure (3):	**(a)** Dome-shaped valve with dysplastic leaflets **(b)** Histologic section shows fibrous dysplasia of the edge of the leaflets but a thinner component proximally **(c)** The sinutubular junction (arrowhead) is markedly accentuated in this section taken close to the raphé	18
Figure (4):	Fusion of the adjacent leaflets along their commissures in valvular pulmonary stenosis	19
Figure (5):	Right atrial abnormality is so obvious that the amplitude of the P wave in lead II is above than that of the following QRS complex	25
Figure (6):	ECG showing right axis deviation and right ventricular hypertrophy	26
Figure (7):	Chest radiograph reveals dilatation of the main pulmonary artery with relatively normal-sized right and left pulmonary arteries	27
Figure (8):	The thickened domed PV leaflets in the RV outflow view	28

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (9):	The echo shows post-stenotic dilation of the pulmonary trunk	29
Figure (10):	Continuous wave spectral Doppler across the pulmonary valve demonstrates a high velocity of flow, and calculated peak instantaneous and mean gradients across the valve	30
Figure (11):	Right ventricular outflow tract angiogram, demonstrating the domed and stenosed pulmonary valve, and allowing measurement of the ventriculo-arterial junction	34
Figure (12):	Right ventriculogram in antero-posterior	35
Figure (13):	Lateral projection showing an angioplasty balloon partially inflated across the pulmonary valve, with the characteristic hourglass impression imposed on the balloon by the stenosed pulmonary valve leaflets	36
Figure (14):	Mechanism of Beta-blockers action in myocytes	48
Figure (15):	Parasternal short axis view to measure pulmonary valve annulus and MPA.	55
Figure (16):	Suprasternal crab view to measure RPA.	55
Figure (17):	Parasternal short axis view to assess severe PR.	56
Figure (18):	The RV dimensions measurement and tricuspid valve annulus measurement in the apical four chamber view.	57
Figure (19):	RV volume measurement at end-diastole	58
Figure (20):	RV volume measurement at end systole	59

List of Figures Cont...

Fig. No.	Title	Page No.

Figure (21): Upper panel shows tracing the end diastolic area of the RV in cm 2 and lower panel shows tracing the end systolic area of the RV to calculate the ECG gated FAC..... 60
Figure (22): TAPSE measurement..... 61
Figure (23): The peak pressure gradient (15 mmHg) across the PV recorded using CW Doppler..... 62
Figure (24): A comparison regarding functional capacity and echocardiographic data obtained at 24 hours and at 1 month post-BPV for the placebo arm. 74
Figure (25): A comparison regarding functional capacity and echocardiographic data obtained at 24 hours and at 1 month post-BPV for the BB arm. 76
Figure (26): A comparison between the two study arms regarding the percent change in RVOT obtained at 24 hours and at 1 month after BPV. 78
Figure (27): A comparison between the two study arms regarding the percent change in PG obtained at 24 hours and at 1 month after BPV. 78

List of Abbreviations

Abb.	Full term
2D	Two-dimensional
AC	Adenylate cyclase
ATP	Adenosine triphosphate
AV	Atrio-venticular
ßB	Beta-blockers
BPV	Balloon pulmonary valvuloplasty
BSA	Body surface area
Ca2+	Calcium
cAMP	Cyclic adenosine monophosphate
CRF	Case report form
ECG	Electrocardiogram
EDV	End diastolic volume
ESV	End systolic volume
FAC	Fractional area change
ICF	Informed consent form
ISA	Intrinsic sympathomimetic activity
L-VDCC	L-type or voltage-gated calcium channel
MPA	Main pulmonary artery
MSA	Membrane stabilizing activity
PA	Pulmonary artery
PDE	Phosphodiesterase
PKA	Protein kinase A
PLAX	Parasternal long axis
PS	Pulmonary stenosis
PR	Pulmonary regurgitation
PSAX	Parasternal short-axis
RVOT	Right ventricular outflow tract

RVOTO .....Right ventricular outflow tract obstruction

List of Abbreviations Cont...

Abb.	Full term
RPA	Right pulmonary artery
RV	Right ventricle
RVH	Right ventricle hypertrophy
RVOT	Right ventricle outflow tract
RVOTO	Right ventricular outflow tract obstruction
RyR	Ryanodine receptor
SD	Standard deviations
TAPSE	Tricuspid annular plane systolic excursion
TR	Tricuspid regurgitation
VA	Ventriculo-arterial

INTRODUCTION

Congenital heart malformations are the most frequent of all major birth defects. Pulmonary stenosis (PS) accounts for approximately 8 - 12% of all congenital cardiac defects, with an incidence of about 1 per 2000 live births worldwide ***(Mitchell and Mhlongo, 2018).***

Amongst congenital heart disease, PS is the second most common congenital cardiac malformation and is accompanied in approximately 20% of congenital heart disease cases ***(Yang and Yi, 2005)***. In Egypt, its prevalence is 2.3 per 10 000 school children ***(Bassili et al., 2000).***

The traditional treatment for pulmonary valve stenosis prior to 1982 was surgical valvotomy. The relief of pulmonary valve stenosis by balloon dilatation during cardiac catheterization was first reported in 1982 ***(Kan et al., 1982).*** Since then, balloon pulmonary valvuloplasty has become the treatment of choice for relief of pulmonary valve stenosis ***(Rao et al., 2007)***.

It is theorized that dynamic right ventricular outflow tract obstruction plays a very crucial role in the immediate post operative period which can cause significant morbidity and mortality ***(Subbarao et al., 1989).*** A case study concerning a patient with worsening right ventricular outflow tract obstruction following BPV has emphasized the need for

preemptive hydration and beta-blocker therapy prior to balloon dilatation ***(Khambatta et al., 2006).***

However, there is an absence of properly designed, randomized controlled trials to assess the role of routinely using beta blockers following BPV, hence the rationale of this study.

AIM OF THE STUDY

To assess the role of beta-blockers on functional capacity and cardiac hemodynamics following BPV in patients with congenital pulmonary stenosis.

Chapter 1

PULMONARY STENOSIS

The first description of pulmonary stenosis as a separate pathological entity was in 1761 by Giovanni Battister Morgagni in Padova Italy, who is generally regarded as the father of modern anatomical pathology ***(Zampieri et al., 2016).***

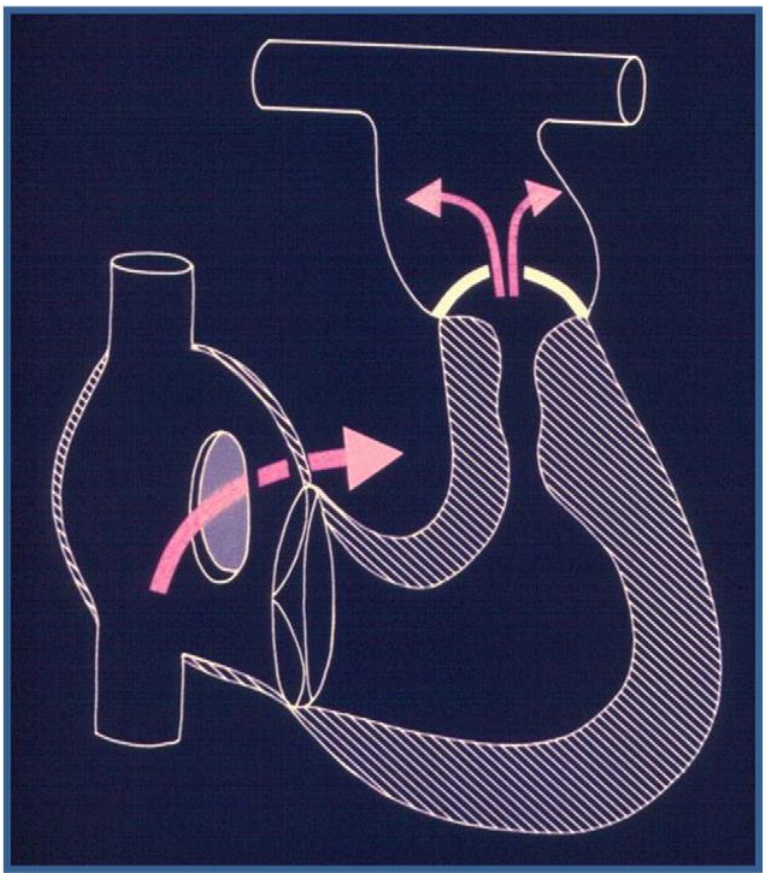

Figure (1): Drawing of pulmonary stenosis with atrial septal defect and left to right shunt well depicting the case of a 16-year-old girl reported by Morgagni. Note the right-to-left shunt at the level of patent foramen ovale ***(Zampieri et al., 2016).***