Prenatal Detection, Intrauterine Vesico-amniotic Shunting and Postnatal Follow up of Isolated Lower Urinary Tract Obstruction Cases

Thesis

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Contents

List of Figures

List of Tables

List of Graphs

List of Appendices

List of Abbreviations

ACE	Angiotensin Converting Enzyme
AGT	Angiotensinogen
AGTr1a/b	Angiotensin II receptor, type 1a/b
AGTr2	Angiotensin II receptor, type 2
AFI	Amniotic Fluid Index
ARPKD	Autosomal Recessive Polycystic Kidney Disease
AUD	Anterior Urethral Diverticulum
AUV	Anterior Urethral Valves
CAKUT	Congenital Anomalies of the Kidney and Urinary Tract
CI	Confidence Interval
COPUM	Congenital Obstructive Posterior Urethral Membrane
CUF	Congenital Urethroperineal Fistula
CUTA	Congenital Urinary Tract Abnormalities
FBSL	Fetal Bladder Sagittal Length
FDA	Food and Drug Administration
HDE	Humanitarian Device Exemption
ICD10	International Classification of Diseases version 10

LUTO	Lower Urinary Tract Obstruction
MCDK	Multicystic Dysplastic Kidney
MDC	Mullerian Duct Cyst
MRI	Magnetic Resonance Imaging
PBS	Prune-Belly Syndrome
PUV	Posterior Urethral Valve
RAS	Renin-Angiotensin System
TOP	Termination of Pregnancy
UPJ	Ureteropelvic Junction
US	Ultrasonography
UTO	Urinary Tract Obstruction
UVJ	Ureterovesical Junction
VACTERL	Vertebral anomalies, Anal atresia, Cardiovascular anomalies, Tracheoesophageal fistula, Renal anomalies, and Limb abnormalities
VCUG	Voiding Cystourethrogram
VUR	Vesicoureteral Reflux
WMCAR	West Midlands Congenital Anomaly Register

Abstract

Prenatal Detection, Intrauterine Vesico-amniotic Shunting and Postnatal Follow up of Isolated Lower Urinary Tract Obstruction Cases

Objectives: The objectives of the study were to determine whether intrauterine vesico-amniotic shunting for fetal bladder outflow obstruction, versus a conservative non-interventional approach improves prenatal and postnatal mortality, morbidity, and renal functions of isolated lower urinary tract obstruction cases. We aimed to find a prognostic index for cases of fetal lower urinary tract obstruction and to determine the safety and efficacy of the shunting procedure.

Patients and Methods: The study included 20 cases of lower urinary tract obstruction (LUTO). Initial ultrasonography was done to all our cases upon detection of tlhe lower urinary tract obstruction and a follow up ultrasounds were performed on 9 cases. The most important indicator to predict renal function was fetal bladder size. Bladder wall thickness, amniotic fluid index and the size of the kidney were of lesser value in the early detection of LUTO. Fetal urine analytes including Sodium, Potassium, Chloride, Calcium, Creatinine and B2 microglobulin were analyzed in 16 cases. In our study of 20 LUTO patients, 6 fell into the intervention group and 14 into the conservative group.

Results: The perinatal and neonatal outcomes of the interventional group were 33.3% terminations of pregnancy, 33.3% miscarriage, 16.6% neonatal death and 16.6% alive at 28 days. The conservative group results included 36% terminations of pregnancy, 7% miscarriage, 14% neonatal deaths, 7% alive at 28 days and 36% dropouts.

Conclusion: Fetal urine biochemical analysis results were not in accordance with the ultrasonographic results nor were they useful in predicting severity of disease and neonatal outcome. Fetal bladder sagittal length was the most important sign in early diagnosis of LUTO. Vesico-amniotic shunting did not alleviate the LUTO condition, nor did it affect neonatal mortality or morbidity.

Keywords: Lower urinary tract obstruction (LUTO), vesico-amniotic shunt, fetal urine analysis, prenatal diagnoses of LUTO, prenatal management of LUTO.

Introduction