Study of Prevalence, Diagnosis and Non-Operative Versus Operative Therapy of Idopathic Meconium Obstruction of the Distal Small Bowl in Very Low Birth Weight Neonates

Thesis

Submitted to the Faculty of Medicine, Ain Shams University,
For partial fulfillment of M. D. degree in ***General Surgery***

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2009

دراسة معدل انتشار، تشخيص ومقارنة العلاج غير الجراحي بالعلاج الجراعي لإنسداد الأمعاء بالعقى الغير واضح الأسباب لدى الأطفال الخدج ناقصى الوزن

رسالة
توطئة للحصول على درجة الدكتوراه فى **الجراحة العامة**

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القاهرة ـ ٢٠٠٩

Acknowledgment

First of all, thanks to God and to every member of my family.

I would like to express my profound gratitude and appreciation to **Prof. Dr. Ibrahim Bassiouny**, Professor of Pediatric Surgery and Head of Pediatric Surgery Unit, Faculty of Medicine, Ain Shamis University who offered his precious time, kind instructions and reassuring advice for supervising this work.

I am also deeply grateful to **Prof. Dr. Tarek Ahmed Hassan,** Professor of Pediatric Surgery, Ain Shamis University for his continuous guidance, help and encouragement throughout this work. His intellectual and moral support helped immeasurably in so many ways.

A big word of deep appreciation and infinite gratitude must be raised to **Dr. Ehab Abdel Aziz Al Shafey,** Lecturer of Pediatric Surgery, Faculty of Medicine, Ain Shamis University, who patiently supervised this task providing me all the time with invaluable comments and helpful advice. I am really appreciative for his detailed examination of early versions of the manuscript. His contributions to the quality of the text have been myriad.

Finally, I would like to thank all the staff members of Pediatric Surgery Department for their kind help and reassurance.

Refaat Mohammed Abd El Sadek

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List of Abbreviations

A-P	: Antero -posterior view
c-AMP	: Cyclic adenosine monophosphate
CF	: Cystic fibrosis
CFTR	: Cystic fibrosis transmembrane conductance regulator
CLD	: Chronic lung disease
CMV	: Cytomegalovirus
DIOS	: Distal intestinal obstruction syndrome
DNA	: Deoxyribonucleic acid
GIT	: Gastrointestinal tract
I N D	: Intestinal neuronal dysplasia
ICC	: Intestinal cells of Cajal
IVH	: Intraventricular hemorrhage
LBW	: Low birth weight
MCT	: Medium chain triglyceride
$Mgso_4$	: Magnesium sulfate
Ml	: Meconium ileus
N-AC	: N-acetyl cysteine
NCCLS	: National comittee for clinical laboratory standards
NEC	: Necrotizing entercolitis
NGT	: Nasogastric tube
NICU	: Neonatal intensive care unit
PDA	: Patent ductus arteriosus
RDS	: Respiratory distress syndrome
RFLP	: Restrictive fragment length polymorphism
SGA	: Small for gestational age
TPN	: Total parenteral nutrition
VLBW	: Very low birth weigh
WBC	: White blood cell

الملخص العربي

من خلال هذه الدراسة تبين أن إنسداد الأمعاء بالعقى لدى الأطفال الخدج ناقصى وزن الجسم الشديد أقل من ألف وخمسمائة جرام عند الولادة هو حالة إكلينيكية فريدة من نوعها حيث أنها تحدث خاصة فى هؤلاء الأطفال الخدج شديدى نقص وزن الجسم وقد يعرضهم ذلك لحدوث ثقوب بالأمعاء الدقيقة وإلى طول فترة مكثهم بالمستشفى لتلقى العلاج إذا لم يتم التشخيص المبكر لتلك الحالات وإعطائهم العلاج المناسب.

هؤلاء الأطفال الخدج شديدى نقص وزن الجسم يعانون من تأخر نزول العقي ويتبع ذلك حدوث الأعراض الأكلينيكية لإنسداد الأمعاء السفلي وفي الغالب يوجد مصاحباً معهم تاريخ مرضي لحدوث تسمم الحمل الإكلامسي لأمهاتهم أثناء حملهم أو تناول أمهاتهم لبعض العقاقير الطبية مثل سلفات الماغنسيوم والتي من المفترض أن يؤدي ذلك كله إلى نقص في معدل الدم المغذي للأمعاء الدقيقة للجنين أثناء وجوده داخل الرحم.

ومن الدراسة تبين أن العقي المتيبس يكون متواجداً بالجزء الأخير من الأمعاء الدقيقة قريباً من إلتقائها بالأعور مما يؤدي إلى صعوبة علاج هذا المرض علماً بأن هذا العقي المتيبس غير مصاحب بمرض التليف الحويصلي.

وتبين كذلك من خلال الدراسة أن الأشعة بالصبغة عن طريق الشرج بإستخدام مادة الجاستروجرافين أنها آمنة، تشخيصية وعلاجية في نفس الوقت وتبين أيضاً أن التأخير في تشخيص هذا المرض وبالتالي التأخير في إعطاء العلاج المناسب ينتج عنه مضاعفات كثيرة أخطرها إنفجار الأمعاء الذي يستدعي التدخل الجراحي العاجل وما يترتب عليه من خطورة على حياة المريض وطول فترة بقائه بالمستشفى ومضاعفة التكاليف المادية وكذلك التأخير في بدء الرضاعة الطبيعية عن طريق الفم.

ونظراً لأ ن هذا المرض وهو إنسداد الأمعاء بالعقيق المتيبس لدى الأطفال الخدج شديدي نقص وزن الجسم أصبح منتشراً بصورة واسعة لذلك يظهر جلياً أهمية تشخيص هذا المرض وأهمية الإدراك والوعي الكافيين به وكذلك معرفة عوامل الخطر التي تؤدي إليه لذلك يتطلب منا بل ويكون من الضروري جداً إعطاء العلاج الطبي المكثف حتى لا يصل بنا الأمر إلى الحاجة إلى التدخل الجراحي وما قد يحدث للمريض من مضاعفات من الممكن تفاديها.

وفي هذه الدراسة تم وضع استراتيجية خاصة للإكتشاف المبكر لهذا المرض وكذلك لطرق علاج الطبية والجراحية.

وتبين أيضاً من هذه الدراسة أن الحالات التي اكتشفت مبكراً وتلقت العلاج الطبي المكثف أعطت نتائج أفضل من حيث التحسن الأكلينيكي ومن ثم أخذ الرضاعة الطبيعية عن طريق الفم وكذلك مدة الإقامة بالمستشفى والتكلفة المادية مقارنةً بالحالات التي إستدعى الأمر فيها إلى التدخل الجراحي.

Acknowledgment

*First and Foremost thanks to "**ALLAH**", the most kind and the most merciful.*

*I want to express my deep thanks and great gratitude to **Professor Dr. Ibrahim Bassiouny,** Professor of Pediatric Surgery and Head of Pediatric Surgery Unit, Faculty of Medicine Ain Shams University who provided me with his precious time & valuable comments to submit this work scientifically. It was a great honor to work under his supervision.*

*I would like express my deep thanks to **Dr. Tarek Ahmed Hassan,** Professor of Pediatric Surgery, Faculty of Medicine Ain Shams University for his continuous guidance, help and encouragement throughout this work. His intellectual and moral support helped immeasurably in so many ways.*

*I wish also to thank **Prof. Dr. Ashraf Kabesh,** Professor of Pediatric Surgery, Faculty of Medicine,, Ain shams university for his great help and support in co-supervising the work.*

*A big word of deep appreciation and infinite gratitude must be raised to **Dr. Ehab Abdel Aziz Al Shafey,** Lecturer of Pediatric Surgery, Faculty of Medicine Ain Shams University, who patiently supervised this task providing me all the time with invaluable comments and helpful advice. I am really appreciative for his detailed examination of early verious of the manuscript. His contributions to the quality of the text have been myriad.*

Finally, I would like to thank all the staff members of Pediatric Surgery Department for their kind help and reasurance.

Refaat Mohammed Abd El Sadek

INTRODUCTION

The improved technology and more sophisticated understanding of neonatal physiology has lead to increased survival of markedly premature infants with increased number of infants with bowel obstruction from inspissated meconium who do not have cystic fibrosis ***(Greenholz et al., 1996)***.

Meconium abnormalities are known to cause multiple neonatal intestinal obstructive syndromes characterized by wide spectrum of severity from the benign meconium plug syndrome to the sometimes, severely complicated meconium ileus associated with cystic fibrosis ***(Emil et al., 2004)***.

Recently inispissated meconium has become a recognized cause of functional bowel obstruction in the low birth weight infants. It has also been called "syndrome of retained meconium", "meconium blockage syndrome", "inspissated meconium syndrome","meconium disease" or the recently designated" meconium obstruction of prematurity" ***(Cox et al., 2004)***.

Meconium obstruction of prematurity is a distinct clinical entity, different from other types of meconium obstruction and not associated with cystic fibrosis. It occurs in very low birth weight (VLBW) infants who develop obstructive symptoms after having passed some initial meconium. This obstruction occurs in infants with particular risk factors, affects the ileum and predisposes to intestinal perforation if not diagnosed and treated promptly ***(Vinograd et al., 1983)***.

Meconium obstruction in the low birth weight infants was not reported until ***1979*** when it was described by ***Sigel et al*** ; in a case report of three patients. Later ***Vinograd et al.,*** described it as " meconium disease " in ***1983*** in a report of

seven patients. Then ***Krasna et al.***, reported meconium obstruction in the low birth weight infants in a report of twenty infants in ***1996***. All these reports described a mild form of the disease not requiring surgery. However in ***1996 Greenholz et al.,*** reported 12 infants with inspissated meconium syndrome requiring surgery mainly due to intestinal perforation.

Dimmitt and Moss published a review of this condition in ***2000***, reporting on a total of 52 cases found in the literature, these patients had a variety of diagnostic findings and were treated by a variety of surgical as well as non surgical methods.

Although the syndrome has been increasingly described in the last twenty years, there has been no agreement on definitive criteria for diagnosis and management. A persistent lack of familiarity of this entity on the part of some clinicians presents the first barrier to its adequate diagnosis and management ***(Emil et al., 2004)***.

Delay in accurate diagnosis and prompt treatment of this condition can result in increased morbidity and mortality in this fragile group of patients. Potential complications include withholding feeds which consequently postpones the attainment of adequate enteral nutrition and growth, bowel perforation and unnecessary surgical producers ***(Cox et al., 2004)***.

Aim of the work

This work is planned to study the prevalence of meconium obstruction among the very low birth weight (VLBW) premature infants. In this thesis we were also specifically aiming to develop strategy for early diagnosis and to select appropriate management of such low birth weight neonates presented with meconium obstruction.

Identifying the characteristics and risk factors of infants susceptible to meconium obstruction of prematurity allows clinicians to maintain a higher index of suspicion and therefore diagnose and initiate treatment in an expedient and safe manner.

Etiology of meconium obstruction in very low birth weight neonates

Meconium is the material found in the intestine of the newborn. It consists of succus entericus that in turn is made up of bile salts, bile acids and debris that is shed from the intestinal mucosa during intrauterine life. It is normally evacuated after birth or sooner in utero as a result of vagal response to perinatal stress ***(Burge and Drewett, 2004)***.

In the premature low birth weight neonates, the etiology of meconium obstruction is thought to be a combination of the highly viscid meconium of prematrurity and poor motility of premature gut ***(Dimmitt and Moss, 2000)***. A premature colon and week peristalsis have been associated with meconium developing into an inspissated and tenacious plug because of increased water absorption ***(Ellis and Clatworthy, 1986)***.

Etiology of meconium obstruction is probably multifactorial. The identified associated factors of intrauterine growth retardation, maternal hypertension, patent ductus arteriosus, hyaline membrane disease, and intraventricular hemorrhage suggest that pre and postnatal intestinal hypoperfusion or ischemia is likely to be involved ***(Blott et al., 1988)***.

Presumably severe prematurity itself, in association with compromised perfusion, results in a final pathway of dysmotility. The microscopic changes of mucoviscidosis potentially could result from failure of distal progression of hepaticopancreatic secretion, and in conjunction with finding of postnatal bacterial overgrowth, could provide histological support for stasis as the underlying pathology. As motility returns, obstructive symptoms appear ***(Talwalker and Kittur, 1987)***.