The Value of Flexible Fiberoptic Bronchoscopy in Pediatric Intensive Care Patients Admitted to the Emergency Department

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Abstract

The study was planned to be a case series, it included eighteen patients who were admitted to the critical care unit of the emergency department of Abo El-Resh pediatric hospital during the period of the study. The objective of the study was to evaluate the use of the flexible bronchoscopy in diagnosis and management of respiratory health problems facing infants and young children.

The mean age in months for the study group was 16.5 + - 14.4. The presenting symptoms were mainly recurrent chest infection 61.6% & stridor 33.3 %. The onset was gradual in 55.6% with progressive course in 72.2%. Family history was positive in 55.6%. General examination showed that the children were either cyanosed in 44.4 % or pale in 55.6%. Chest examination showed diminished air entry in 50%. Lab investigations illustrated mean HB was 9.4 +- .9, platelet count, coagulation profile, KFT and LFT were all within normal.

The majority of the group was below the 5 th Percentile 94% for weight. Chest x ray and CT were abnormal. Stridor, persistent collapse & recurrent pneumonia were the main indications for doing the flexible bronchoscopy.

Variety of diagnostic results was shown: subglottic stenosis 27.8%, mucus plug 16.7 %, inflamed air ways and secretions 16.7%. BAL analysis illustrated the causative organism and antibiotic needed.

The study showed the diagnostic and management value of the flexible bronchoscopy of the study group.

Key words
Stridor- pneumonia- bronchoscopy- dyspnea

Acknowledgment

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LIST OF ABREVIATIONS

A-E folds: Aeri-epiglottic folds
BAL: bronchoalveolar lavage
BP: blood pressure
CF; cystic fibrosis
CFTR: cystic fibrosis transmembrane conductance regulator
CMV: cytomegalovirus
CRP: C reactive protein
CRX: chest X-ray
CAP: community acquired pneumonia
CT: computed tomography
C.trachomatis: Chlamydia trachomatis
ED: Emergency department
ET: endotracheal tube
E.Coli: Escherichia coli
FFB: Flexible Fiberoptic bronchoscopy
FOB: Fiberoptic bronchoscope
FB: flexible bronchoscopy
FEV: forced expiratory volume
H.Influenza: Haemophilus influenzae
ICU: intensive care unit
ICP: intra cranial pressure
IC; immunocompromised children
IV: intravenous
LMA: Laryngeal mask airway
MAC; Mycobacterium avium complex
MRI: magnetic resonance imaging
NICU: neonatal intensive care unit
PEEP: positive end expiratory pressure
PICU: pediatric intensive care unit
PLT: platelets
PCP: Pneumocystis carinii pneumonia
PMN: polymorphonuclear
RDS: respiratory distress syndrome
RR: respiratory rate
S. aureus: Staphylococcus aureus
S.pneumonia: Streptococcus pneumoniae
TEF: Tracheo-esophageal fistula
TBB: transbronchial biopsy
TA: tracheal aspirate
TB: tuberculosis
TLC: total leukocytic count
VC: vocal cord
VAP: ventilator acquired pneumonia
Wt: weight

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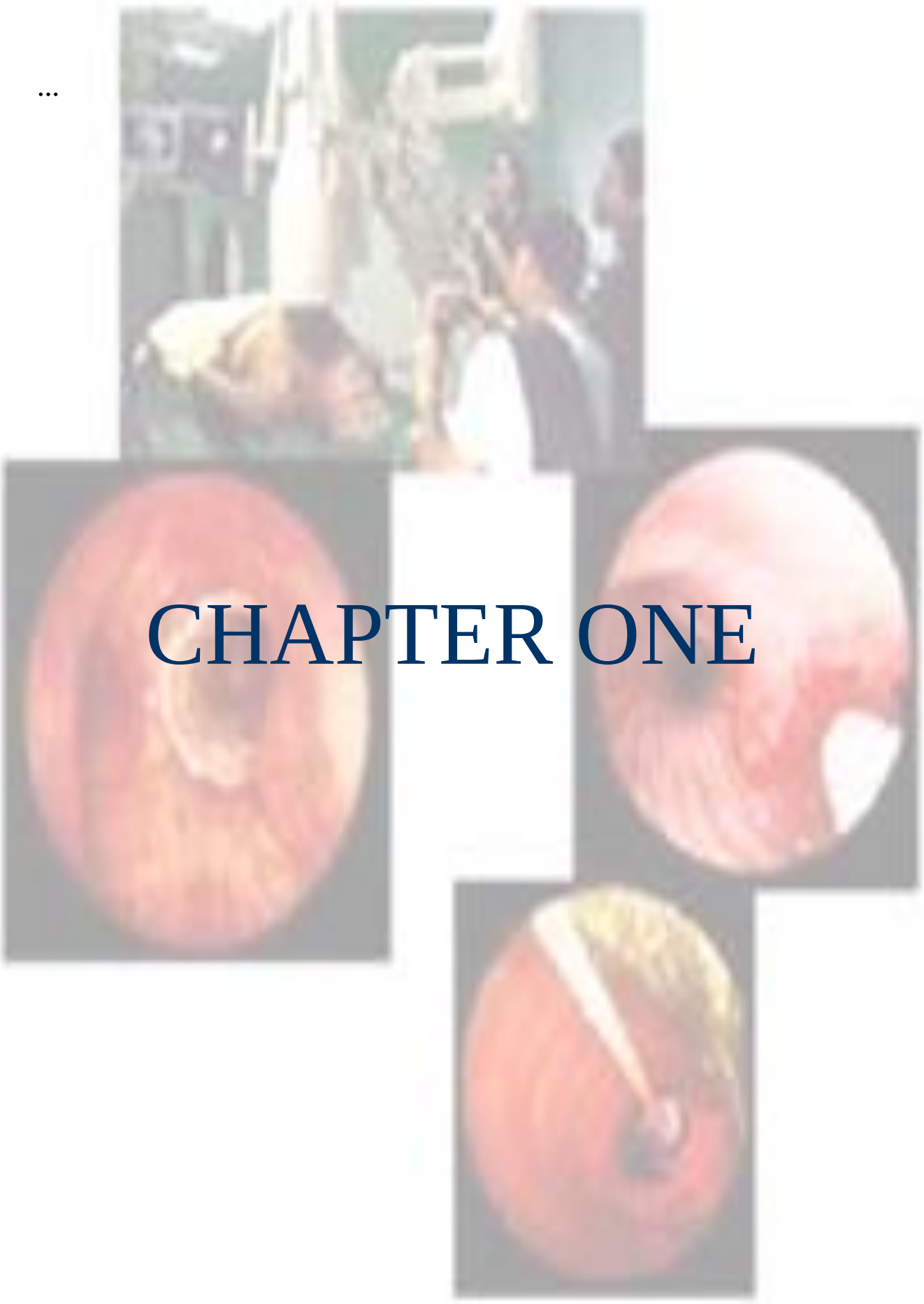

CHAPTER ONE

Introduction

And

Aim of Work

Introduction

An emergency can be defined as acute illness which with lack of prompt and appropriate treatment will result in death, disability or delayed recovery. ***(Baldwin & Hall, 1994).*** Respiratory failure is the most common cause of cardiopulmonary arrest in pediatric patients.

Therefore, prompt recognition, assessment, and expert management of respiratory emergencies are critical to obtain the best possible outcome ***(Alexander & Budi, 2003)***.

Prompt recognition of the obstructive respiratory emergency and then correct management are critical to achieve optimal clinical outcome ***(Weiner, 2000)***. Flexible fiberoptic bronchoscopy (FFB) is frequently used in the assessment and treatment of infants and children with a varaiety of pediatric respiratory diseases (Nussbaum, 2002), and it is particularly important in the diagnosis and treatment of specific respiratory problems in critically ill infants and children hospitalized in the pediatric ICU (PICU) ***(Dan Bar & Yakov, 2004)***.

FFB is indicated when the benefits outweigh its risks and when it is the best way to obtain diagnostic information ***(Wood, 1998)***. It should be noted that FFB is superior to rigid bronchoscopy in the assessment of airway dynamics; because less positive end expired pressure is applied during the examination ***(Balfour and Spencer, 2002)***. Indications for diagnostic bronchoscopy vary with the age of the patient. The diagnostic yield of FFB can be increased by the information obtained with bronchoalveolar lavage (BAL) and biopsy of the mucosa ***(Payne et al, 2003)***. Indications include: airway obstruction, stridor, persistent/recurrent wheezing, atelectasis, recurrent/persistent consolidations, atypical and unknown infiltrates, localized hyperinflation, suspected foreign body aspiration, evaluation of the artificial airway, restoration of airway patency, mucus plugs or blood clots, alveolar filling disorders (alveolar proteinosis, lipid pneumonia), bronchoalveolar lavage, biopsy of the bronchial mucosa or endobronchial lesions and endoscopic intubation ***(Dan Bar & Yakov, 2004)***. Most previously reported studies that analyzed the contribution of pediatric FFB originated from cohorts of noncritically ill patients with a variety of airway and lung diseases who were treated under the pediatric pulmonary services outside the PICU ***(Nussbaum, 2002)***. At present, the only study that specifically studied the application of FFB in the PICU was published in 1988, before BAL became widely accepted and airway surgery cases were not included ***(Godfrey et al, 1997)***.

Hence, there is only little information on the yield of FFB and BAL in the PICU and because PICU patients differ from other patient groups in terms of systems stability and the underlying problems. They should be evaluated separately for clinical benefits, indications, contraindications, and complications ***(Dan Bar and Yakov, 2004)***.

Aim of Work and Objectives:

- To evaluate the contribution of Flexible Fiberoptic bronchoscopy (FFB) and Bronchoalveolar lavage (BAL) to the clinical management of patients in the pediatric intensive care unit of the Emergency Department, Cairo University.

- To evaluate the effectiveness of FFB in the treatment of infection associated atelectasis in children not responding to medical treatment.

- To provide clinical useful data in children with recurrent wheezing poorly responsive to bronchodilator therapy, and assess whether cellular analysis of BAL is useful in suggesting an infectious or inflammatory process.

- To assess causes of difficult weaning and extubation failure in critically ill ventilated children.

- To evaluate the role of BAL in the diagnosis of infectious causes of pulmonary infections including community acquired and ventilator associated pneumonia.

Respiratory Emergencies