POSTOPERATIVE PULMONARY COMPLICATIONS FOLLOWING ABDOMINAL SURGERY

Principle investigator: Dr. **Omer Alamoudi**, MRCP, FCCP
Assistant Prof, Consultant Pulmonologist
Department of Medicine

Co-investigator: Dr. **Mohammed Alharbi**, FRCSC
Assistant prof, Consultant Surgeon
Department of Surgery

OBJECTIVES:

1 - To assess the pattern of the postoperative pulmonary complications following abdominal surgery.

2 - To assess the risk factors contributing to the postoperative pulmonary complications following abdominal surgery.

3 - To correlate between the type of abdominal surgery that causing postoperative pulmonary complications and the organ involved in surgery.

HYPOTHESIS:

1 - Patients underwent abdominal surgery were at high risk of postoperative pulmonary complications.

2 - Postoperative pulmonary complications are higher following upper abdominal surgery, than lower abdominal surgery.

3 - Surgery of upper abdominal organs carry higher risks of postoperative pulmonary complications than surgery on lower abdominal organs.

BACKGROUND AND RATIONALE

Pulmonary complications remain the most important cause of postoperative morbidity and mortality. Several reports showed that the incidence of postoperative pulmonary complications (POPC) is about 22%. Among those complications are atelectasis, pneumonia, pulmonary embolism, aspiration of gastric or oropharyngeal, hypoxemia, respiratory failure and impaired pulmonary function tests (decreased vital capacity VC).

It is well known that upper abdominal surgery is associated with a much greater incidence of POPC than lower abdominal surgery. The mechanism of the reduced VC, hypoxemia, and radiological atelectasis after abdominal surgery is not established. Postoperative pain, and muscle splinting, reduction in spontaneous deep breath and impaired cough have all been postulated as likely mechanism. Diagnosis of POPC may be difficult to establish, and most studies rely on the presence of fever, cough, hypoxemia, atelectasis, pleural effusion, pneumothorax, and radiological infiltration as an indicators for diagnosis.

METHODS

Data collection

This is a retrospective study in which all patients who underwent abdominal surgery between 1992-1995 will be reviewed to detect the presence of POPC. The following informations will be extracted from the patients charts Postoperatively, whenever possible.

1 - Personal data including (age, sex, occupation, weight, and history of smoking)

2 - Type of operation (emergency/elective), duration of operation and type and duration of anesthesia.

3 - Incisional site and organ involved (incision above the umbilicus indicate upper abdominal surgery, while incision below the umbilicus indicate lower abdominal surgery)

4 - Detection of risk factors (obesity, diabetes, bronchial asthma, COPD, hypertension, ischemic heart disease)

5 - Measurements of PFTs (FVC, FEV1), arterial blood gases, blood sugar, serum albumin, ECG, CPK and BP.

6 - Pre and postoperative treatment with bronchodilators and anti-inflammatory drugs (nebulizer/inhaler, frequency, duration of therapy) (If the patient is asthmatic or having COPD)

7 - History of incentive spirometry usement pre and postoperatively (frequency, duration), measurement of peak expiratory flow meter pre and postoperatively)

8 - Use of prophylactic antibiotic, antacid and anti aspiration measures pre and postoperatively

Postoperative Course

Postoperative course will be considered from the date of operation to the date of discharge or death. The postoperative pulmonary complications will be classified into 4 grades according to Kroeke et al (Arch Intern Med, May 1992) with some modification. These information will be ascertained by detailed chart review.

Grade 1 Dry cough
Microatelectasis (Temperature>37.5, abnormal lung findings, chest radiograph either normal or abnormal)
Dyspnea, not due to other documented cause

Grade 2	Cough, (productive not due to other documented cause)
	Bronchospasm
	Hypoxemia
	Atelectasis, (radiologically, fever>37.5, clinically)
	Hypercarbia
	Adverse reaction to pulmonary medication (e.g. theophylline toxic reaction)
Grade 3	Pleural effusion
	Pneumonia suspected (radiologic evidence without bacteriological confirmation)
	Pneumonia proved (radiological evidence and documentation of organism by gm stain or culture)
Grade 4	Ventilatory failure (postoperative ventilator dependence exceeding 48 hours)

Statistical analysis

Data analysis will be entered into the personal computer using suitable data base. Data processing and subsequent analysis will be performed using one of the statistical packages. Descriptive statistics will be calculated for all variables. Students t test will be used for comparisons of continuos data, Chi-square test will be categorical data.

Significance

KAUH is the most important Centre that serve western province of Saudi Arabia. Every year more than 500 operations (major and minor) were performed at this Centre. The postoperative pulmonary complications, and the risk factors causing it at this center are unknown. Our study is the first one that have been performed at KAUH to look for the pattern of these complications, and the risk factors causing it. We do feel this study will help to improve our practice and consequently will improve our patients management.

Data Collection Sheet

1 - Patients name_____

2 - Hospital No_____

3 -Serial no_____

4 - Age_____Y

5 - Height_____cm

6 - Weight_____kg

7 - Sex_____1- M_____2 - F_____

8 - Occupation_____

9 - Date of operation_D___M___Y___

10 - Date of discharge _D___M___Y___

11- Smoking 1- Non smoker 2 - Ex-smoker 3 - Smoker more than 20 cig/day for >20 Y 4 - Smoker less than 20 cigarette/day <20 Y

12 - Type of operation 1- Gall bladder (biliary, cholycystectomy)

2 - Gastric 3 - Spleen (spleenectomy) 4 - Colorectal

5 - Small bowel 6 - Anal 7 - Appendectomy

8 - Laparatomy 9 - Other, please specify the name of operation and organ involved_____

_____

13 - Type of surgery 1 - Elective 2 - Emergency 3 - Major

4 - Minor

14 - Duration of operation 1 - Less than one hour 2 - 1 to 2 hs

3 - 2 to 4 hs 4 - > 4 hs

15 - Incisional site 1 - Upper abdomen (above umbilicus) 2 - Lower abdomen (below umbilicus)

16 - Type of incision 1 - Midline 2 - Subcostal 3 - Other please specify_____

17 - Type of anesthesia 1 - General 2 - Local 3 - Spinal 4 - Other, please specify_____

18 - Duration of anesthesia 1 - Less than 1 h 2 - 1 to 2 hs 3 - 2 to 4 hs 4 - > 4 hs

19 - Associated disease 1 - Obesity 2 - Diabetes 3 - Br Asthma 4 - COPD 4 - Hypertension 5 - Ischemic heart disease

20 - If the patient has (Asthma or COPD) answer this question

1 - Bronchodilators (Ventolin) 2 - Steroid 3 - Other therapy please specify_____

POSTOPERATIVE DATA (from date of operation to date of discharge)

21 - Blood pressure_____mmHg

22 - Blood Sugar preop 1 - Fasting_____ 2 - 2 HPP_____ postop 3 - Random_____

23 - Type of Diabetes If any 1 - Insulin dependent 2 -On oral hypoglycemic 3 -On diet

24 - Serum Albumin_____

25 - Has the patient developed any of the following symptoms postoperatively, if yes circle where its appropriate

1 - Fever ≥ 38C°_____	2 - Dry cough	3 - Microatelectasis
4 - Dyspnea	5 - Productive cough	6 - Yellow sputum
7 Wheeze	8 - Atelectasis	9 - Pleural effusion
10 - Pneumonia	11 - Pneumothorax	12 - Pul. embolism
13 - Postop Ventilator > 48 h		

26 - ABG Preop 1 - PO2_____ 2 - PCO2_____

Postop 3 - PO2_____ 4 - PCO2_____

27 - Sputum gram stain and culture 1 - --ve 2 - +ve

if +ve Specify the organism isolated_____

28 - Radiological findings 1 - Normal 2 - Consolidation

3 - Effusion 4 - Infiltration 5 - Atelectasis

6 - Pulmonary edema 7 - Other please specify_____

_____

29 - Pulmonary function test 1 - FVC (%predicted)_____

2 - FEV1 (%predicted)_____3 - FEF25-75 (%predicted)_____

Definition

Grade 1	Dry cough
	Microatelectasis (Temperature>37.5, abnormal lung findings, chest radiograph either normal or abnormal)
	Dyspnea, not due to other documented cause
Grade 2	Cough, (productive not due to other documented cause)
	Bronchospasm (not
	Hypoxemia
	Atelectasis, (radiologically, fever>37.5, clinically)
	Hypercarbia
	Adverse reaction to pulmonary medication (e.g.. theophylline toxic reaction)
Grade 3	Pleural effusion
	Pneumonia suspected (radiologic evidence without bacteriological confirmation)
	Pneumonia proved (radiological evidence and documentation of organism by gm stain or culture)
Grade 4	Ventilatory failure (postoperative ventilator dependence exceeding 48 hours)