

## Is Routine Preoperative Chest X-ray Indicated in Elderly Patients Undergoing Elective Surgery?

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### Abstract

**Background:** In our hospital pre-operative chest x-ray (CXR) are routinely requested without prior establishment of any medical indication for patients of 70 or more years of age who are undergoing elective surgery. The aim of this study was to determine if routine preoperative chest x-rays are justifiably indicated for elderly patients undergoing elective surgery in the University of Nigeria Teaching Hospital, Enugu.

**Method:** One hundred and twenty consecutive patients aged 70 or more years were studied between January 2003 and December 2005. As part of our routine preoperative evaluation, detailed history and thorough physical examination were carried out with a view to eliciting symptoms and signs that would normally indicate chest X-ray. Pre-operative ECG were also examined for presence or absence of abnormalities that could indicate chest X-ray. Preoperative chest X-rays of the 120 patients were also studied and radiological findings noted.

**Results:** Ninety (75%) out of 120 patients had medical indications for chest X-ray. The remaining 30 (25%) were considered to lack medical indication for chest X-ray. Overall, 105 out of the 120 (84%) patients had abnormal findings on chest X-ray.

**Conclusion:** Routine preoperative chest X-rays in the elderly patients are worthwhile even without medical indication.

**Key words:** Elderly patients; preoperative chest X-rays.

Date accepted for publication: 11<sup>th</sup> March 2008

Nig J Med 2008; 150 - 152

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### INTRODUCTION

Preoperative evaluation serves to provide the anaesthetist with information needed to assess risk and to plan anaesthetic care<sup>1</sup>. The most important components of preoperative assessment are a careful history and physical examination. Laboratory and ancillary tests should be ordered only when indicated by the results of the history and physical examination.<sup>2</sup>

Preoperative chest X-rays have long been an accepted routine for certain patient categories. In our hospital routine chest X-rays are requested without prior medical indications for patients of 70 or more years of age. Chest radiographs, however, have not been shown to provide

useful information that would not otherwise be suspected based on the history and physical examination.<sup>2</sup> Therefore, current recommendations are to request a chest X-ray only in patients with abnormal physical findings, history of cardiac or pulmonary disease, history of heavy smoking, or age greater than 75 years<sup>3</sup>. The study by the National Institute for Clinical Excellence (NICE) OF THE United Kingdom recommended that a test should be done only if the results will affect patient treatment and outcomes.<sup>4</sup> A chest X-ray is not required routinely in patients below 60 years of age but should be obtained in the following situations: if there is a history or physical sign of cardiac or respiratory disease; if there are metastases from carcinoma; before thoracic surgery; or in recent immigrants (who have not had a chest X-ray within the previous 12 months) from countries where tuberculosis is endemic.<sup>5</sup> In general if the clinical status is good, the radiography will add little to clinical decision making<sup>6</sup>. The pre-operative chest X-ray is a poor indicator of functional impairment but is important for several reasons: as a baseline for assessing post-operative radiographs; to discover any localized disease of lungs and pleura not detected on clinical examination, for example, neoplasm, collapse, consolidation or effusion; to reveal underlying generalized lung disease in patients presenting with acute pulmonary symptoms such as pulmonary fibrosis or emphysema.<sup>7,8</sup>

At present a chest X-ray (P-A or lateral film) costs about seven hundred naira (N700) only. Huge amounts of money could be saved if chest X-rays are requested only when absolutely indicated.

The aim of this study was to determine whether it is necessary to order for preoperative chest X-ray routinely for all elderly patients going for elective surgery.

### METHODS

This was a prospective study of 120 consecutive general, urological and orthopaedic surgical patients aged 70 or more years presenting for elective surgery at the University of Nigeria Teaching Hospital Enugu (UNTHE) between January 2003 and December 2005.

These patients were interviewed and examined with special regard to findings that would normally indicate chest X-ray such as history or findings that suggest cardiac or pulmonary disease, history of heavy smoking, presence of hypertension, and abnormal ECG.

Preoperative chest X-rays of these patients were examined and radiological findings recorded. The study was observational and results were described as numbers and percentages.

## RESULTS

The median age of the patients was 75 years (range, 70-80 years). Seventy two (60%) patients received general anaesthesia while 48 (40%) received regional anaesthesia. Preoperative chest X-ray was performed in all 120 patients. Abnormal findings from history, physical examination and chest X-rays were recorded in table 1. Ninety (75%) patients had medical indications for chest X-ray. Only 30 patients (25%) were without any of these indications for chest X-ray. (Table I).

Abnormal X-ray findings were noted in 105 (84%) patients and this number included 15 out of the 30 patients who had no medical indication for chest X-ray (Table I).

**Table I: Abnormal findings in the patients including symptoms, signs, and X-ray findings**

(1)	Symptoms	Number of patients (%)
	Dyspnoea	40 (33%)
	Cough dry	30 (25%)
	Cough productive	20 (17%)
	Chest pain (pleuritic)	15 (12%)
(2)	Signs	Number of patients (%)
	Abnormal breath sounds (diminished, absent, bronchial, vesicular with prolonged expiratory phase)	60 (50%)
	Restriction of chest movement (on one or both sides)	50 (42%)
	Tactile fremitus (increased, reduced, or absent)	40 (33%)
	Hypertension	30 (25%)
	Tracheal deviation	25 (21%)
	Abnormal percussion notes (Dull or hyperresonant).	15 (12.5%)
(3)	Abnormal X-ray findings	Number of patients (%)
	Unfolding of aorta	90 (75%)
	Cardiomegaly	80 (67%)
	Alveolar infiltrate	20 (17%)
	Emphysema	20 (17%)
	Pneumothorax	15 (12.5%)
	Pleural effusion	10 (8%)

## DISCUSSION

A total of 2400 general surgical, urological and orthopaedic operations were performed at our centre

between January 2003 and December 2005 out of which 120 (5%) were performed on patients of 70 years or more of age. Pathological chest X-ray findings were seen in 105 (84%) out of the 120 elderly patients.

This high incidence of pathological X-ray findings does not agree with the findings of Tornebrandt and Fletcher<sup>9</sup>. In their study of 100 patients of 70 or more years of age in Sweden pathological X-ray findings were seen in 43% of their patients.

Our findings, however, concur with the findings of Stafenson<sup>10</sup> who demonstrated that 92% of his 109 patients aged 70 years and above in Great Britain had pathological X-ray findings. In a country such as Great Britain where the incidence of pulmonary disease is high<sup>9</sup>, pathological X-ray findings would be expected to be high. A high incidence in this age group was also reported in a study from Washington<sup>11</sup> in which it was recommended that a lateral projection should be regarded as part of the routine chest X-ray.

In this study, 90 (75%) of the 120 patients had medical indications for chest X-ray. Of the remaining 30 who had no medical indication for chest X-ray, 15 (50%) demonstrated abnormal X-ray findings. This proves that chest X-ray can reveal diseases of lungs and pleura not detected on clinical examinations.

In order to avoid excessive irradiation, X-rays taken up to 1 year previously should be accepted, unless the history or findings suggest a significant change in status. Most of the papers cited by us showed a high incidence of pathological findings on chest X-ray in elderly patients. Just how much these findings influence peri-operative management is difficult to quantify, but we feel that the high incidence in itself justifies routine pre-operative chest X-ray in elderly patients.

In conclusion, this study has shown that there is need for routine pre-operative chest X-ray in elderly patients. This will obviously avoid disruptions to theatre lists and delays in patient care caused by, for example, inadequate initial assessment of the need for chest radiographs.

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