

Assessment of Perioperative Risk Factors; Medical Disorders, ASA Classifications, MRC Scale, Smoking and Opium Habit among Elderly Patients for Elective Surgery: Tehran-Iran

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ABSTRACT

Background: Background: Elderly patients are more likely to require surgery and are at greater risk for surgical complications than young age group. The causal factors include decreasing physiologic reserve and increasing number of underlying health check problems. The aim of the current study is to evaluate preoperatively common medical disorders and habits as risk factors among elderly patients.

Method: The protocol of study was finalized with an interview and was completed in several standard screening questionnaires.

Results: A total of 155 subjects completed the criteria of study. Mean age was recorded 69.8±5.7 SD years (female: 52%, male: 48%). Frequency of smoking habit, opium using and alcohol drinking was 42 % (male; 53%), 15% (male; 85%) and 5%. Common disorders included respiratory (36%), cardiovascular (31%), diabetes mellitus (11%), renal (7%) and cerebrovascular (5%). Frequency of perioperative mortality risk of elderly patients occupied ASA classifications, including; classes=III 33% and IV =37%, respectively. The significant differences were seen between ASA classifications and MRC scale ($\chi^2<0.001$). However, meaningful differences were found between gender and opium using ($\chi^2<0.001$, odd ratio=7.6).

Conclusion: Our finding indicated that mortality rate of perioperative risk was considerably based upon ASA physical status classification among elderly Iranians. It may be due to significant prevalence of respiratory and cardiovascular diseases, and also additionally present hazardous habits as smoking and opium using among aged patients. Surgical team should be awarded respect to social habits and frequency of disorders among the old-age population.

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► *Implication for health policy/practice/research/medical education:*

Mortality rate of perioperative risk was considerably based upon ASA physical status classification

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1. Introduction:

Perioperative evaluations of patients conduct in order to decreasing length of hospitalization, reducing operative complications and preventing known effects of common disorders on the outcome of the operations (1). However, it provides judgment of operating team for improving prognosis and quality of surgical procedures. The perioperative consultation is a well-known policy to support recent goals. Current reports showed the most common diseases disregarding the type of operations that affected on the surgical outcome, including; pulmonary disease, heart diseases, diabetes mellitus and malnutrition (2). Significant prevalent morbidity and mortality in surgery is related to complications of the cardiac, respiratory and infectious diseases (3). The aging process alone impresses on the complication's adjustment (4), and however, it correlates likelihood with underlying elderly disorders, which may be silent. Estimated prevalence of the Iranian old-age (>65) was 5.19% since 2006 years (5). In addition, prevalence assessment of diseases and local habitude of the target population should be considered for the perioperative evaluation.

The purpose of this study is to identify prevalence of known common diseases and focus on the local habitude among elderly patients who had been undergoing elective surgical operations.

2. Materials and Methods:

This is an observational cross-sectional study which was conducted in Logman Hakeem general teaching hospital, Shahid Beheshti University of Medical Sciences (SBUMS), Iran –Tehran, since 2008-2009 years. The hospital is in the south of

Tehran; capital of Iran. Annual hospitalization and surgical procedures rates were 170,000 and 50,000 patients.

The target population of elective surgical procedures enrolled sequentially among old-aged patients who were admitted for perioperative consultation through the chest clinic. This assessment was performed as outpatient protocol. The entrance criteria included age over than 60 years and to be satisfied to follow the study. Perioperative assessment of sample population was made by screening questionnaire. It consisted of two topic groups; background, review of medical disorders and measurement tools. Physician interviewed in person the entire patients, and completed the designed questionnaire. Screening questionnaire had been validated, and negative response was 2% (6). It consists of 29 standard questions, and added answers are about status of habits; opium using, smoking and alcohol consumption. Highlight topics included demographic data, type of operation, cardiac, pulmonary, gastrointestinal, kidney, endocrine, central nervous system, hematologic diseases. In addition, questionnaire gathered information about history of the anesthetic reaction or medical problems with previously anesthesia, review of prescribed drugs and functional class of activity. All patients should be consulted perioperatively for cardiovascular diseases. The data was added to the questionnaire.

Measurement tools comprehended American Society of Anesthesiology classification (ASA) (7) and Medical Research Council dyspnea scale (MRC) (8). The ASA classifications identify perioperative mortality risk of applying anesthesia on the general physical status of systemic disturbances, and assigned as five classes; I= 0.06- 0.08, II= 0.27-0.4, III=

1.8-4.3, IV= 7.8-23% and V= 9.4-51% . The MRC dyspnea scale is a pulmonary functional status scale that is useful to assess shortness of breath and disability, and can assist in the evaluation of disease severity. Levels of severity subdivided into five classes.

Laboratory parameters included blood cell count, fasting blood sugar, electrocardiogram, standard chest x -ray, pulmonary function test.

The variables summarized as frequency and Mean $\pm$ standard deviation. The descriptive statistical analysis of Chi-square tests was applied. Value of $p < 0.05$ was set through the study (Tow tailed).

3. Results:

One hundred and fifty five elderly patients completed criteria of study. Mean age was recorded 69.8 ± 5.7 SD, ranged between 60-82 years (Median; 73), (52% female and 48% male).

Table 1 shows the frequency of risk factors among perioperative elderly patients for elective procedures. Frequency of common diseases included respiratory (36%), cardiovascular (31%), diabetes mellitus (11%), renal (7%) and cerebrovascular diseases (5%). Graph 1 discloses the total frequency distribution of the evaluated perioperative diseases in elderly patients. Frequency of perioperative diseases with respect to

Table 1: It shows frequency of diseases in perioperative elderly patients

Diseases among elderly	Frequency%
Respiratory diseases:	36.2
Chronic obstructive pulmonary disease	48.4
Asthma	33.2
Interstitial lung disease	10.6
Cardiovascular diseases:	31.1
Hypertension	14.7
Congestive heart failure	12.9
Myocardial infarction	12.9
Unstable angina	4.8
Other diseases	32.7
Diabetes mellitus	10.9
Renal disease	7.3
Thyroid disease	5.1
Cerebrovascular disease	4.1

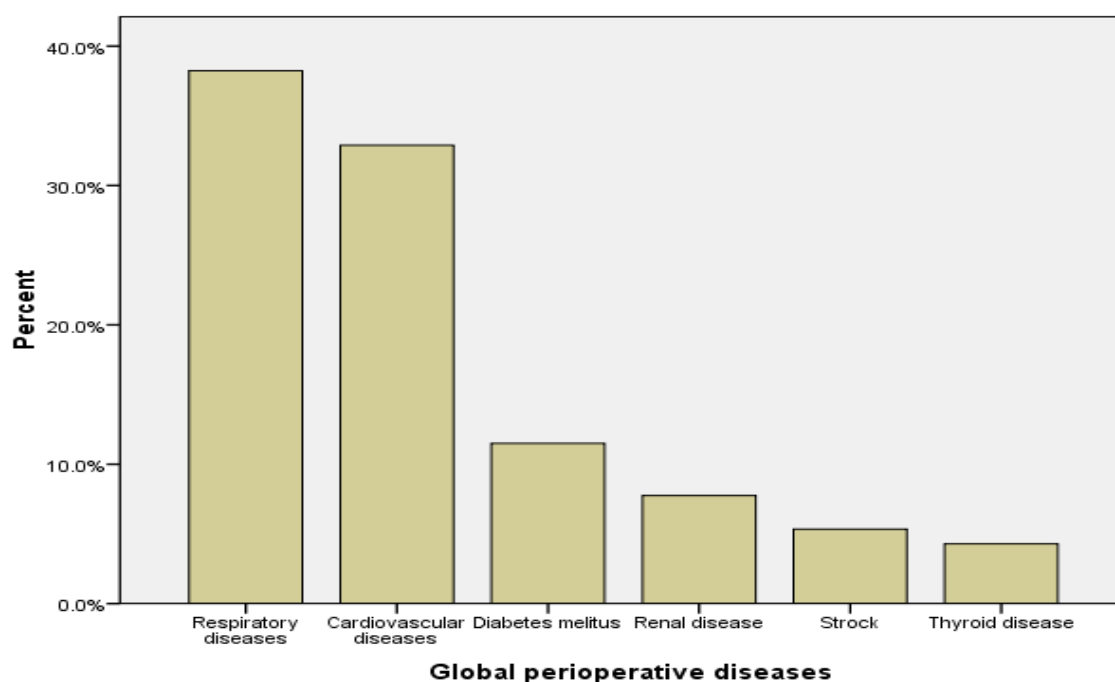


Fig. 1. It reveals distribution of preoperative disease evaluated between elderly population in Tehran.

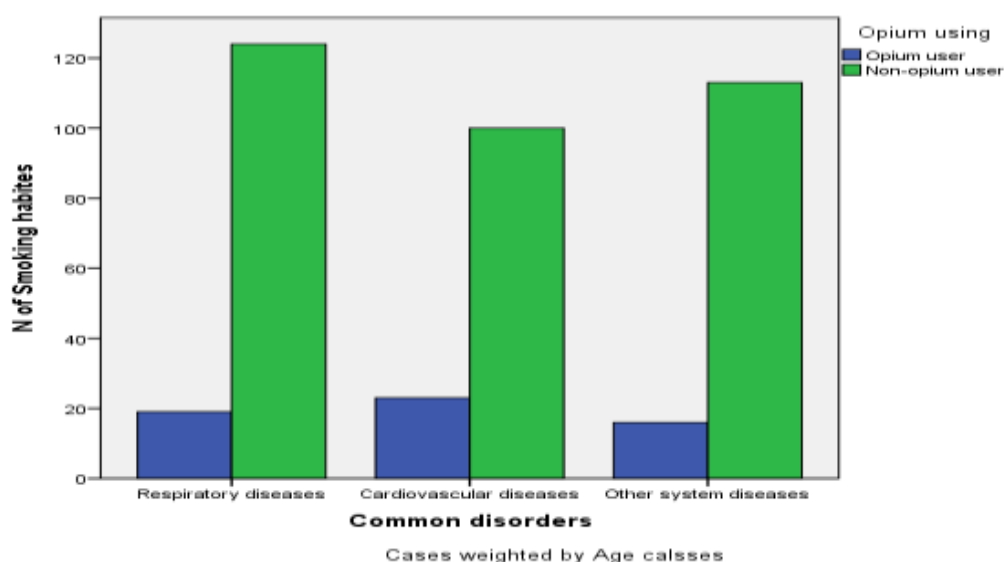


Fig. 2. It demonstrated frequency distribution of smoking and opium using between major group of disease.

different age classes reflected remarkable distribution of respiratory disease in (65-69 years), cardiovascular disease in (70-74 years), diabetes mellitus and renal diseases in (>75 years). Mean age in the female subset was 72.38 ± 5.18 SD years. It ranged between 60-82 years, (Mode= 75, Median=73). Prominent distribution of age

class consisted of over 75 years with frequency of 38%. Severity of MRC functional class and ASA calcification included mild 48% and V -class 42%, individually. Frequency of smoke and opium use, were 46% and 26%, respectively. The most common diseases were distributed as respiratory 34%

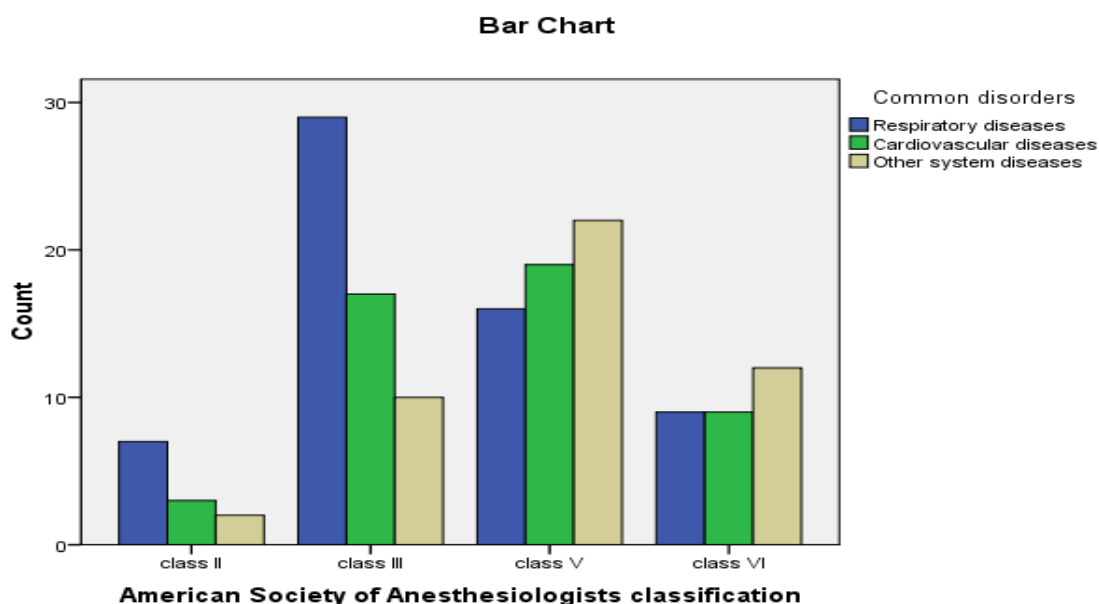


Fig. 3. It shows distribution of common disorders in the ASA classes.

cardiovascular 26% and diabetes mellitus 15%. Airway obstructive diseases were noticeable as respiratory diseases, COPD 48% and bronchial asthma 33%. Congestive heart failure 11%, hypertension 7% and ischemic heart diseases 5% were individually significant as cardiovascular diseases.

Female sex was noticeably distributed in all common disease groups except diabetes mellitus. There were significant differences between sex and perioperative diseases ($F=5.2$, $p=0.02$).

Mean age in male sex was 71.9 ± 5.05 SD years, ranged over 60-80 years with mode and median were 73 years and 72 years, respectively. Noted age class with 37% frequency was between 70 to 74 years. Frequency distribution of MRC and ASA had severity between different classes. It was detected in moderate stage 47% in MRC and III-class 34% in ASA. Evaluated frequency of preoperative diseases included pulmonary 39%, cardiovascular 36% and diabetes mellitus 7%. COPD and bronchial asthma were meaningful between respiratory diseases and distribution of 55%, 25%, respectively. CHF 10%, hypertension 8% and IHD 4% were considerable among cardiovascular diseases. Frequencies of tobacco smoking,

opium use and drinking which were recorded between cases, include 38%, 5% and 5%, respectively.

The abdominal surgery had the highest frequency among other types of operations (42%). It occurred markedly in the entire age classes and sex subsets.

Global frequencies of smoking habit, opium use and an alcohol drinking was 42% (male: 52%, female: 48%), 15% (male: 83%, female: 17%) and 5%. There were relevant differences between gender and opium use ($\chi^2 < 0.001$, odd ratio = 7.6). Frequencies of smokers and opium users' subjects were distributed noticeably in the respiratory disease (42%) and cardiovascular disease subgroups (42%). Graph 2 discloses the distribution of smokers and opium users frequency among marked diseases of the target population.

Marked frequency distribution of perioperative mortality risk was observed in ASA classifications at classes of III (33%) and IV (37%), respectively. Distinguished frequency distribution of severity of dyspnea in MRC scale was detected at mild (46%) and moderate scales (45%). Significant differences were seen between ASA classifications and MRC scale ($\chi^2 < 0.001$). Meaningful

frequency of opium users and tobacco smokers were located in classes of III and V of ASA. However, distribution of respiratory and cardiovascular diseases had a considerable frequency in classes of III (48/35) and V (26/40) of ASA. Graph 3 reveals distribution of common disorders ASA classes.

4. Discussion:

The main finding of current study demonstrated that the most common frequency of risk factors among perioperative elderly patients included respiratory, cardiovascular, diabetes mellitus, renal diseases and cerebrovascular accidents, respectively.

COPD was found as a highly significant disease among respiratory diseases. It was against the resultants of current reports that presented the cardiac diseases 3. In addition, it may be agreed with meaningful frequency of smoking and opium habit among the selected population. Effect of tobacco smoking on development of respiratory diseases such as COPD and exacerbation of pulmonary diseases has been recognized in the last two decades (9). Cigarette smoking has been implicated as risk factors for postoperative pulmonary complications (10). However, the subjects with smoking habit are two to six times more likely susceptible to complications than nonsmokers 13.

15% of habitual users of opium in elderly may have additive effects on increasing frequency of respiratory diseases. Opium has been traditionally used in illness and pain killing. Men were the main group of elderly population who occasionally used opium as smoking manner. It influences on the respiratory system as a toxic inhalation, and also predisposes individuals to chronic bronchitis. Their effect on the respiratory center was known as a suppression agent. In addition, it can change the bulk of anesthetic drugs and analgesic threshold medications. Urban population living in high-traffic cities is susceptible to occult respiratory and cardiovascular diseases. Current report

indicated that air pollution caused by vehicles is a predisposing factor for developing inflammatory airway diseases and bronchial hyperresponsiveness (11). It occurred as the result of adverse effects of airborne particles 12. Tehran is a city with high traffic and air pollution, and all the recent conditions can be effective for the rate of respiratory and cardiovascular frequency.

Abdominal operations were prevalent in elderly patients in current study and contribution of significant respiratory diseases was considerable in target population. Recent report demonstrated that rate of postoperative complications ranged from 30% to 40% in population of intraperitoneal procedures associated with respiratory diseases (12). However, the operation team and surgeon should be notified to assume a strategy in order to reduce morbidity and mortality. Rate of ENT surgery (24%) in our study may impress referral center. The fractures are common in elderly individuals resulting from osteoporosis and orthopedic surgeries that usually have been applied.

Gender differences in expression of COPD were reported (13) and prevalence of physician –diagnosed COPD in women outpaced the men (14). Results indicated that prevalence of COPD among the target population of female was considerable (48) than male (33). A portion of findings may be related to distribution of frequency of gender differences in the selected population despite that, our results supported the concept of overall prevalence of COPD that was higher in women. In addition, opium habit was insignificant in female population. Our knowledge indicated that mortality rate in female with COPD increased five-fold in early years, and for the first time number of dying women surpassed the men (15). Therefore, perioperative care of women should be considered as an impact issue in the first line of health.

An ASA classification is a tool that provides a concept of expected risk of operation for an anesthesiologist. MRC

dyspnea scale indicates integrity of the respiratory system. Both tools produce the judgment about estimation of perioperative surgical risk. There was a significant association between stages of ASA classes and MRC scales. Targeted patients occupied moderate to severe stages. It supported that elderly patients were at noticeable risk of surgery in selected population with respect to underlying respiratory and cardiovascular diseases.

In conclusion, important risk factors in perioperative elderly patients included respiratory, cardiovascular, diabetes mellitus and renal diseases, respectively. In addition, abdominal operation was more common procedure in our study. Opium habit as a medical problem was a new concept that was found. It should be considered in old-aged patients. It was different data with respect to the other studies. Knowledge of common diseases in elderly patients should be considered by surgical team in perioperative conditions for minimizing mortality and morbidity.

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