

# Assessment of postoperative complications for patients undergoing orthopedics surgery at Al-Hilla teaching hospital

Ahmed Ramiz Helal,<sup>a</sup> Fakhria Jaber Muhbesb<sup>a</sup>

<sup>a</sup>Adult Health Nursing Department, Nursing University of Babylon, Babylon, Iraq.

Correspondence to Fakhria Jaber Muhbes (email: ahmed.886@yahoo.com).

(Submitted: 29 November 2016 – Revised version received: 24 December 2016 – Accepted: 29 December 2016 – Published online: 26 March 2017)

**Objective** This study aimed to assess the complications that may occur in postoperative patients after orthopaedic surgery and find out the relationship between postoperative complications and other variables such as (age, gender, etc.).

**Methods** The sample of the study was a purposive sample of 100 adult patients who had orthopaedic surgeries in upper and lower extremities. The patients were observed and assessed after their admission for 5 days.

**Results** The results of this study indicated that a high percent of postoperative complications occurred in age between 18 and 27 years. The highest percentage (38%) of patients were smokers. Medications used had an effect on postoperative complications especially corticosteroids. The rate of infection among smokers was more compared to non-smoker patients, with significant relation.

**Conclusion** The demographic features of 100 postoperative patients indicated that the majority of the sample patients were males. The total score of complications in this study indicated that there was a significant relationship between some variables and postoperative complications at the following (age, smoking, other occupation, education level, and medications used).

**Keywords** postoperative complications, orthopaedic surgery, infection, haemorrhage

## Introduction

Postoperative complications are continuous threats to the wide range of patients undergoing surgical interventions. The increase of postoperative complications can lead to long-term disability and probably death.<sup>1</sup> Some of postoperative complications can be related to operations, such as haemorrhage or wound infection.<sup>2</sup> Moreover, complications after surgery for prosthetic fracture can be dangerous.<sup>3</sup> Length and type of procedure, anaesthesia to be used, and familiar required position may increase the probable postoperative complications.<sup>4</sup> All surgical procedures, simple or compound, repetitive or unusual, can be associated with complications. In addition, any surgical procedure can be accompanied with some bleeding in major operation.<sup>5</sup> Early postoperative haemorrhage throughout the immediate postoperative period commonly indicates insufficient operative haemostasis or a technical accident, such as a slipped ligature or undiagnosed trauma to a blood vessel. Postoperative haemorrhage may occur after several days, which may be late. It is commonly related to infection, which is commonly occurred in the late postoperative period.<sup>6</sup> In the US, surgical site infections were developed in varying severity in at least 2% of the patients.<sup>7</sup> A late infective complication of surgery is commonly related to external material, such as a non-absorbable suture, wire, sometime necrotic fascia, ligament. Overall wound healing is underdeveloped if the blood supply is poor or if the location of the wound is beneath excess suture tightness.<sup>6</sup> Pre-operative and post-operative risks can be assessed for various surgical diseases and surgical procedures.<sup>8</sup> Nevertheless a more specific measured relationship that comprises all the patients and surgical factors, such as longer length of stay, requirement for a prolonged care facility, readmission to the hospital, and increased body mass index (BMI), older age (elder than 65 years) undergoing knee and hip arthroplasty may have a complex risk of early problems and other adverse results after operation.<sup>9</sup> Smoking is a main wellbeing problem as well as financial problems. It is recognized that it has a harmful result on surgical patients.<sup>10</sup> Therefore, pre-operative abstinence of smoking should be suggested and an

abstinence period of at least four to six weeks looks to be the most beneficial.<sup>1</sup> Smoking is a significant risk factor for the increase of postoperative pulmonary complications, wound healing, cardiopulmonary complications.<sup>11</sup> Pain may be occur in most operating wounds but in the majority of the cases, nearly some of the wounds are more painful than others this can be controlled by strategic analgesia.<sup>6</sup> For these reasons, the patients should be assessed preoperatively and postoperatively to help them in decreasing and alleviating the postoperative complications. Therefore, the aims of this study are to:

1. Assess the complications, which may occur in postoperative patients after orthopaedic surgery
2. Find out the relationship between some socio-demographic characteristics, some medical information and postoperative complications.

## Materials and Methods

### Design of the Study

A descriptive analytic study.

### Sample of the Study

The sample of the study was a purposive sample of 100 patients who had orthopaedic surgeries with lower and upper extremities' under general anaesthesia. The sample was selected by the interview of the patients after their admission to obtain the required data.

### Setting of the Study

The study was carried out from 25 January 2016 to the 30 November 2016, at Al- Hilla Teaching Hospital.

### Instruments

The questionnaire was constructed for the purposes of this study. The data collected through the use of questionnaires

which were consisted of three parts, the first part was socio-demographic information consisted of five items including gender, age, residence, occupation, and education level. The second part of the questionnaire including medical information, such as smoking, alcohol drink, length of hospital stay and the site of operation while the third part of the questionnaires were comprised of post-operative complications, such as anaesthesia, adverse effects, cardiovascular complications, pulmonary complications, urinary complications. The sample was selected according to following criteria: Adult patients (18 years older). The patients scheduled for orthopaedic surgeries (upper limbs, lower limbs) under general anaesthesia and didn't have respiratory, cardiovascular, peripheral vascular disease and diabetes or chronic diseases. The researchers assess the patient in the recovery room and in the orthopaedic surgery wards. They reviewed the patients' charts to collect the required data. The complications appeared on the patients were classified into three parts, less complications, moderate complications, and high complications. The patients were informed about the purposes of this study and their verbal consent was taken. The data were analyzed by using the statistical package for social sciences (SPSS) through the application of descriptive (frequency, percentage, Pearson Chi-Square).

## Results

A total of 100 patients were enrolled to participate in this study. This study showed that more than half (55%) of the patients were within the age range from 18 to 27 years and the lowest percent (8%) were within the age range from 48 to 57 years in both sex, in addition more than half of the study sample (72%) lived in urban, while the highest percentage (34%) of patients in both educational level primary and intermediate schools (Table 1). This study found that most of the patients (65%) had operations in the lower limbs. The body mass index of 100 patients indicated that the majority of them (56%) were overweight or obese, but (11%) of patients were underweight. In addition, negative reaction showed in a high percentage (15%) of patients within the cough, and the lowest percent (2%) were within wheezing and spasm (9%). However, the finding of this study revealed that dyspnea appeared in 8% of patients sample, and the majority of the sample (70%) had pain at operation sites, while the lowest percentage (2%) of them had hematoma and weaker fixation for fracture (Table 2). The result of this study showed that the total score of various complications. The less complication rate was 14%, while moderate complications were 21%, and the highest complications percentage (65%) in the study sample (Table 3).

Table 4 demonstrates that the highest percentage 57 (36.8%) of patients who were non-smokers had vomiting, and 43 (16.2%) of the patients who were smokers complained of vomiting. There were no significant relations between smoking and vomiting at first postoperative day. The rate of vomiting in female was more than half 15 (60%), while in male the rate of vomiting 85 (22.3%) with smoker and non-smoker patients and there was a high significant relation between gender and vomiting at first postoperative day. Pearson Chi-Square (value = 8.964a). Nevertheless the rate of infection in smokers was 43 (11.6%), while in non-smoker 57 (1.7%) of the sample. In addition, there was a high

Table 1. Socio-demographic data of patient for 100 patients

Variables		Frequency	Percent
Gender	Female	15	15.0
	Male	85	85.0
Age	18–27	55	55.0
	28–37	28	28.0
	38–47	9	9.0
	48–57	8	8.0
Residence	Urban	72	72.0
	Rural	28	28.0
Occupation	Governmental employed	23	23.0
	Housewife	15	15.0
	Free job	62	62.0
Education levels		Frequency	Percent
Unable to read and write		3	3.0
Read and write		17	17.0
Primary school		34	34.0
intermediate school		34	34.0
Secondary school		6	6.0
Institute		3	3.0
university		3	3.0

Table 2. Postoperative complications

Complication	Frequency	Percent (%)
Vomiting	28	28.0
Dizziness	26	26.0
Shivering	23	23.0
Sore throat	18	18.0
Delirium	29	29.0
Drowsiness	28	28.0
Discomfort	12	12.0
Wheezing	2	2.0
Cough	15	15.0
Spasm	9	9.0
Oral trauma	5	5.0
Dyspnea	8	8.0
Difficulty of urination	3	3.0
Vomiting	2	2.0
Delay of stool pass	7	7.00
Fever	7	7.0
Persistent fever (temperature $\geq 38^{\circ}\text{C}$ )	21	21.0
Abscess	6	6.0
Hematoma	2	2.0
Operation site complication		
Hemorrhage	3	3.0
Infection	6	6.0
Weak fixation for fracture	2	2.0
Pain	70	70.0

significant relationship between smoking and postoperative wound infections (Table 4).

## Discussion

The present findings revealed that complications from anaesthesia appeared in some of the patients they included delirium (29%), vomiting (28%), drowsiness (28%), dizziness (26%), shivering (23%), sore throat (18%) and oral trauma (5%). The findings of the present study were in agreement with Tennant et al., (2012)<sup>12</sup> who stated that nausea appeared in 30%, vomiting in 24%, sore throat in 44% and 19% with oral trauma in patients after general anaesthesia. The rate of vomiting in female was more than in male with smoker and non-smoker. In addition, there was a high significant relation between gender and vomiting at first postoperative day. The symptoms of nausea and vomiting occurred in patients within long time of operation using of nitrous oxide for the preservation of anaesthesia had been revealed to raise the risk of postoperative nausea and vomiting.<sup>13</sup> Postoperative shivering can occur

due to mild hypothermia and anaesthesia, in addition to exposure to a cold operative room environment and intra-operative IV fluid. The findings of the present study were supported by Hasankhani et al., 2004.<sup>14</sup> Atelectasis was found relatively in all patients who were anaesthetized and may be happened in the basal part of the lungs. Most atelectasis occur in supine posture near the diaphragm and after cardiac surgery with cardiopulmonary bypass. The majority of the atelectasis were seen during general anaesthesia resolutions within 24 h after surgery, but respiratory complications occur during or immediately after anaesthesia.<sup>15</sup> Difficulty of urination, delay of stool pass were registered as 3% and 7%, respectively, due to anaesthesia effect. The incidence of difficulty of urination occurred postoperatively immediately, while the delay of stool pass happened until the fifth postoperative day. Baldini et al. (2009)<sup>16</sup> reported that the retention of the urine is usually occurred in post-anaesthesia with surgical patients. The rate of occurrence was between 5% and 70%. In addition, they stated that comorbidities, type of anaesthesia, type of surgery encourage the increase of retention of urine after surgery. The current study revealed that the rate of infection in smokers more than in non-smokers with high significant differences. The Pearson Chi-Square value = 4.237a. This finding was in agreement with Ajuzieogu (2013).<sup>17</sup> In his study on 61 (63%) patients were males, while 36 (37%) were females. He declared that the infection of the wounds happened in men (6.2%) but three (3.1%) women had advanced wounds contagion. Moreover, all smoker patients in the present study developed wound infection. This finding is supported by Khan et al., (2008).<sup>18</sup> They stated that wound infections progressive in 6 patients (5.76%), deep wound infection recorded in 4 patients (3.84%) and superficial wound infections were 2 (1.92%) of patients were with aged 30–60. They had a history of smoking. In addition, a study by Rodriguez-Argueta (2011)<sup>19</sup> reported that smoking habit may be a cause of increased postoperative wound infections. In regards to haemorrhage, the current study revealed that 3% of patients had haemorrhage, the type of haemorrhage was a minor in two patients with operations at upper limbs and one patient at lower limbs. Sobieraj et al. (2012)<sup>20</sup> declared that the occurrence of bleeding and minor haemorrhage in orthopaedic surgeries in about 5% of all patients with total knee replacement and total hip replacement. They added that the usage of pharmacological prophylaxis decreases major venous thromboembolism, but augmented with minor haemorrhage. Moreover, prolonged duration of operation may be a cause of excessive slight haemorrhage. Regarding "Pain", the results of this study showed that the majority of both genders felt pain after surgery. The pain relieved gradually with the use of analgesic. A similar study carried out by Barbosa et al. (2014)<sup>21</sup> They found that the incidence of pain in eighty-eight patients (65.7%) had immediate postoperative pain, while 33 (62.2%) of them had the pain in the first postoperative, and 18 (75%) of the sample complained from pain in the second postoperative. Also a study by Vaurio et al., (2006)<sup>22</sup> reported that most of patients (27.3%) had pain when they were at rest. The intensities of the pain were moderate to severe. Moreover, a study by Capdevila, et al., (2005)<sup>23</sup> declared that the usage of general anaesthesia was accomplished in (73.6%), and

Table 3. Total score of complications and chi-square test

Complications rate	Frequency	Percent
Less complications	14	14.0
Moderate complications	21	21.0
High complications	65	65.0
Total	100	100.0

  

Variable	Pearson Chi-Square		S or N.S
	Value	Expected count	
Gender	.955 <sup>a</sup>	2.10	N.S
Age	66.007 <sup>a</sup>	1.12	S
Residence	.009 <sup>a</sup>	3.92	N.S
Smoking	20.057 <sup>a</sup>	6.02	S
Occupation	24.694 <sup>a</sup>	2.10	S
Education	53.706 <sup>a</sup>	.42	S
Alcohol	.277 <sup>a</sup>	.98	N.S
Medication	40.128 <sup>a</sup>	.42	S

S, significant; N.S, no significant.

Table 4. Smoker, gender with vomiting at first day and infection with smoking and Chi-Square test

Variable	Vomiting first day			Pearson Chi-Square	
	No	Yes	Total	Value	Expected count
No smoker	36	21	57	5.141 <sup>a</sup>	12.04
Smoker	36	7	43		
Male	66	19	85	8.964 <sup>a</sup>	4.20
Female	6	9	15		

  

Variable	Infection			Pearson Chi-Square	
	No	Yes	Total	Value	Expected count
No smoker	56	1	57	4.237 <sup>a</sup>	2.58
Smoker	38	5	43		

the usage of analgesics after surgery was active in 96.3% of the patients. However, the pain marks were well-known during the first postoperative day ( $P$  value = 0.01).

## Conclusion

Based on the finding of this study, it can be concluded that postoperative complications have an adverse influence upon surgical outcomes. The release of patients can be delayed from the hospital because of the risks of life threatening. The total score of complications of the study indicated that there were significant relationships between postoperative complications

and some variables such as (age, smoking, other occupations, education levels, and medications used).

## Recommendations

This study recommends (1) surgical nurses should perform preoperative care and teaching about risk factors for surgical patients, (2) nurses should help the surgical patients and advise them about the prevention of postoperative complications, (3) more studies with large samples should be conducted to discover the incidence of postoperative complications in various surgical procedures.

**Conflict of Interest** None. ■

## References

- Tjeertes EK, Ultee KH, Stolker RJ, Verhagen HJ, Gonalves FB, Hoofwijk AG, Hoeks SE. Perioperative Complications are Associated With Adverse Long-Term Prognosis and Affect the Cause of Death After General Surgery. *World journal of surgery*. 2016 Nov 1;40(11):2581-90.
- Gowanda A, Weiser T. The WHO Guidelines for safe Surgery, 2<sup>nd</sup> edition, United States of America, 2009;59:141.
- American Academy of Orthopedic Surgeons (AAOS), Orthoinfo.Org, fracture after total hip replacement, 2013;P. 4.
- Doenges ME, Moor House MF, and Murr AC. Nursing diagnosis manual planning, individualizing, and documenting client care, 2<sup>nd</sup> edition, Printed in the United States of America, by F. A. Davis Company, 2008;p. 411.
- Mazzara JT. After knee replacement surgery, MD orthopedic surgeon, Available free from: <http://www.Orthodoc.aaos.org/jtmazzara>. 2001.
- Burkitt HG, Quick CRG, Reed JB. Essential surgery problems, diagnosis and management 4<sup>th</sup> edition, printed in China, Churchill Livingstone Elsevier, 2007;171-176.
- Pear SM. Perioperative concepts and nursing management, managing infection control, patient risk factors and best practices for surgical site infection prevention, postoperative nursing management, workhorse publishing L.L.C.2007;chapter 20, Unit 4, pp. 57, 62.
- Verma R, Wee MYK, Hartle A, Alladi VR, Rollin A-M, Meakin G, Struthers R, Carlisle J, Johnston P, Rivett K, Hurley C. AAGBI safety guidelines, pre-operative assessment and patient preparation the role of the anesthetist, London, The Association of Anaesthetists of Great Britain and Ireland 2010;12-32, Available free from: <http://www.aagbi.org>.
- Higuera CA1, Elsharkawy K, Klika AK, Brocone M, Barsoum WK. 2010 Mid-America orthopaedic association physician in training award: predictors of early adverse outcomes after knee and hip arthroplasty in geriatric patients. *Clin Orthop Relat Res*. 2011;469:1391-1400.
- Nåsell H, Adami J, Samnegård Eva, Tønnesen H, Ponzer S. Effect of smoking cessation intervention on results of acute fracture surgery. *J Bone Joint Surg AM*. 2010;92:1335-1342.
- Møller A M, Pedersen T, Villebro N, and Munksgaard Anne. Effect of smoking on early complications after elective orthopedic. *J Bone Joint Surg Br*. 2003;85:178-181.
- Tennant I, Augier R, Crawford-Sykes A, Ferron-Boothe D, Meeks-Aitken N, Jones K, et al. Minor postoperative complications related to anesthesia in elective gynecological and orthopedic surgical patients at a teaching hospital in Kingston, Jamaica, *Rev Bras Anesthesiol*. 2012;62:188-198.
- Aitken Head RA, Smith G, Row both am J D. Postoperative Nausea and Vomiting, *Textbook of Anesthesia, Day Case Anesthesia*, 5<sup>th</sup> edition, printed in China, Churchill Livingstone Elsevier, 2008; pp. 528,529,536.
- Hasankhani H, Mohammadi E, Nighzade MM, Moazzami F, Mokhtari M. The effects of warming intravenous fluid on perioperative hemodynamic status, postoperative shivering and recovery in orthopedic surgery. *Can Oper Room Nurs J*. 2007;25:20-24, 26-27.
- O'Brien J. Absorption atelectasis: incidence and clinical implications, *AANA J*. 2013;81:205-208.
- Baldini G, Bagry H, prikian AA, Carli F. Postoperative urinary retention, anesthetic and perioperative considerations. *Anesthesiology*. 2009;110:1139-1157.
- Madu K, Ajuzieogu OV, Humphrey A. E, Adaobi O A. Relationship between theatre population and post operative wound infection following implant surgeries. *WebmedCentral ANAESTHESIA*. 2012;3:WMC003524.
- Khan NA, Quan H, Bugar JM, Lemaire JB, Brant R, Ghali WA. Association of postoperative complications with hospital costs and length of stay in a tertiary care center, cost of postoperative complications. *J Gen Intern Med*. 2006;21:177-180.
- Rodriguez-Arguteta O F, Figueiredo F, Valmaseda-Castellon E, and Gay-Escoda C. Postoperative complications in smoking patients treated with implants a retrospective study. *J Oral Maxillofac Surg*. 2011;69:2152-2157.
- Sobieraj DM, Coleman CI, Tongbram V, Lee S, Colby J, et al. Venous thromboembolism prophylaxis in orthopedic surgery. Agency for Healthcare research and Quality U.S. Department of Health and Human Services, 49, 2012;es-1,5,23.
- Barbosa MH, Araújo NF, Silva JAJ, Corrêa TB, Moreira TM, Andrade EV. Pain in orthopedic surgeries, pain assessment intensity and pain relief in patients post-operative orthopedic surgery, *Escola Anna Nery Revista de Enfermagem*. 2014;18:144,145.
- Vaurio LE, Sands LP, Wang Y, Mullen EA, Leung JM. Postoperative delirium: the importance of pain and pain management. *Anesth Analg*. 2006;102:1267-1273.
- Capdevila C, Pirat P, Bringuier S, Gaertner E, Franc, Singelyn O, Bernard N, et al. Continuous peripheral nerve blocks in hospital wards after orthopedic surgery: a multicenter prospective analysis of the quality of postoperative analgesia and complications in 1,416 patients, *Anesthesiology*. 2005;103:1035-1045.

This work is licensed under a Creative Commons Attribution-NonCommercial 3.0 Unported License which allows users to read, copy, distribute and make derivative works for non-commercial purposes from the material, as long as the author of the original work is cited properly.