

Research Article**ESTIMATION OF THE INCIDENCE OF INTRAOPERATIVE AWARENESS AND RECALL IN WAD MEDANI TEACHING HOSPITAL - SUDAN**AbdAllah AbdAlrazig Bushir Mohammed¹, Dr. Nawal Mukhtar Mohammed²¹BSc. Anaesthesia, Gezira University²M.D Anesthesia, University of Khartoum

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ABSTRACT

The study was having been conducted in Wad Medani Teaching Hospital from March to September 2016. The objective of the study was to estimate the incidence of awareness under general anesthesia in Wad Medani Teaching Hospital for patients undergoing general anesthesia. The study designed as observational cross-sectional study; the data was collected by structural questionnaire filled during interview with the patients after their agreement. Cases of awareness and recall have been observed in 13.3 % among the study population. The study concluded that incidence of awareness under general anesthesia in Wad Medani Teaching Hospital is highly significant and more than the international practice and literature. It is also concluded that many factors caused this incidence of awareness include the decreased number of anesthesiologists, lack of proper funding for the hospital and anesthesia department, absence of anesthetic gases monitor sensors in the used anesthesia machine, and absence of anesthesia depth monitors.

Keywords: Awareness, recall, general anesthesia.**Introduction**

The study was an estimation of the incidence of awareness under general anesthesia in Wad Medani Teaching Hospital from March to September 2016. The study aims to evaluate the extent of the intraoperative awareness and recall in the area of the study, to check for the presence of the preventive monitors, and to identify the possible causes of the intraoperative awareness and recall. The problem of the study is the experience of consciousness while the patient managed to be under general anesthesia for surgery, this problem may expose the patient to feel total paralysis, pain and distress while the patient is awake during surgery. Awareness under G.A causes intra-operative physiological responses such as hypertension and tachycardia; also it may lead to post-operative psychological complications. The study has been designed to be observational cross – sectional study.

The methods

The study has been conducted in Wad Medani Teaching Hospital which is located in Wad Medani City in Sudan between March to September 2016.

Wad Medani Hospital have been established in 1927, and it was the only hospital in the city. Now the hospital contains 292 beds including 79 beds for general surgery department and 30 beds for Ear, Nose and Throat department. (1)

The study has been designed to be observational cross – sectional study and the sample size have been decided based on equation to calculate the required sample.

The researcher made interviews with patients underwent surgery under general anesthesia after their agreement for the interview, the data collected by filling questionnaire form during the interview.

The data have been analyzed using SPSS program (Statistical Package for Social Sciences)

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, the result of the analysis that the data was significant .

The variables of this study are: general anesthesia, awareness under general anesthesia, patients, and surgery

General anesthesia is a drug-induced, reversible condition that includes specific behavioral and physiological traits — unconsciousness, amnesia, analgesia, and akinesia — with concomitant stability of the autonomic, cardiovascular, respiratory, and thermoregulatory systems. (2)

Unlike the connotation in cognitive science, the meaning of awareness implies both consciousness and explicit recall of the intraoperative period; thus, it represents a paradox as the purposes of the anesthesia are both unconsciousness and amnesia. (3)

Patients included in the study were any adult patients who agreed to be interviewed after exposure to surgery under general anesthesia in Wad Medani Teaching hospital.

Patients excluded out of the study are patients who refused to be interviewed , who were under 16 years of age , had intracranial surgery , suffered mental confusion , unable to

communicate in Arabic or English, or discharged before the postoperative visit .

There are two surgical departments in the hospital which are: the general surgery department and the E.N. T department. The other surgical specialties separated from the hospital in more specialized facilities.

Results & Discussion

The study included 384 cases in Wad Medani Teaching Hospital; all of the cases were adults which were exposed to different surgical procedures under general anesthesia. The data have been collected using a questionnaire filled by the researcher during the interviews with the patients. The data has been statistically analyzed using SPSS.

As mentioned earlier, there are two specialties in Wad Medani Teaching Hospital which are the G.S and the E.N.T. In table 1, the distribution of these specialties has been presented among the study population. The majority of the cases was general surgery cases which is a main department in the hospital, the E.N.T department has less load of work and has no daily list as in the case of the G.S department.

Table 1: Distribution of the surgical procedures in the study population:

Type of surgery	Frequency	Percentage	Cumulative Percentage
General Surgery	315	82.0 %	82.0 %
E.N.T surgery	69	18.0 %	100.0 %
Total	384	100 %	

As it shown in figure 1, younger patients (16 to 36 years of age) have formed the majority of the study population , and it has been noticed that the number of patients has decreased by the advancement of age among the study population .

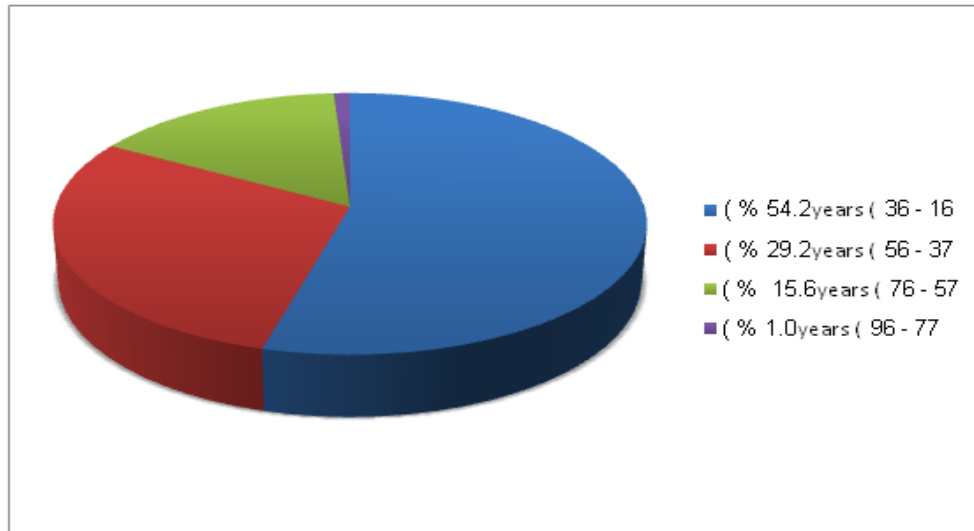


Figure 1: Age distribution in the study population:

Among the study population , 13.3 % have reported experience of awareness under general anesthesia .The remaining cases was completely unconscious during general anesthesia .As shown in table 2 , the data was highly significant for incidence of awareness under G.A (P- value < 0.001 , which is less than 0.05) .

Table 2: Distribution of Awareness under G.A cases among the study population:

Study cases	Frequency	Percentage	Cumulative percentage	P-value
With awareness	51 cases	13.3 %	13.3 %	<0.001
Without awareness	333 cases	86.7 %	100 %	
Total	384 cases	100 %		

As in the case with the study population, the G.S cases have formed the majority of the awareness cases as it presented in table 3.

Table 3: Distribution of Surgical procedures among the awareness under G.A cases:

Type of Surgery	Frequency	Percentage	Cumulative percentage	P-value
G.S	46 cases	90.2 %	90.2 %	< 0.001
E.N.T	5 cases	9.8 %	100 %	0.024
Total	51 cases	100 %		

The percentage of the awareness under G.A among the G.S cases was 14.6 % as it shown in table 4 , and these cases formed the majority of the awareness cases in the study as shown in table 3 .

Table 4: Distribution of awareness under G.A cases among the G.S procedures in the study population

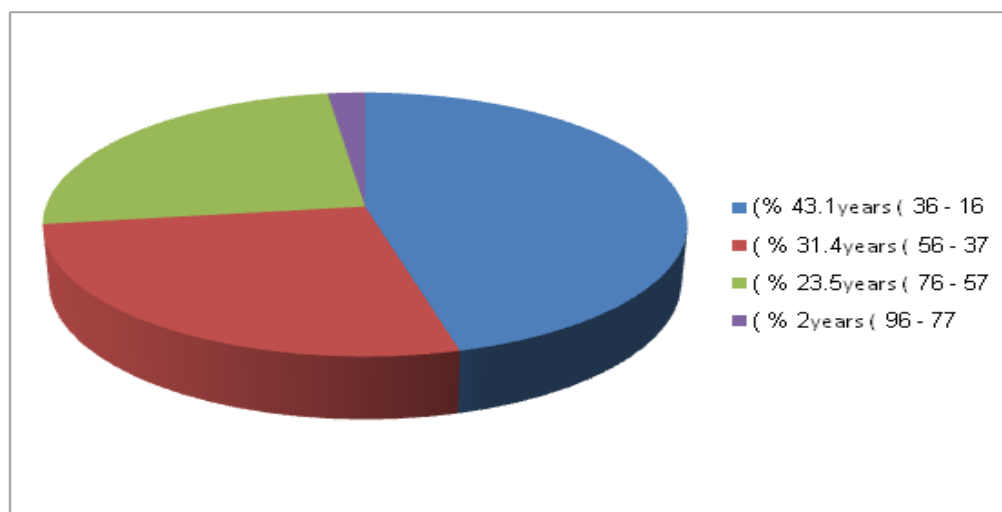
Presence of awareness	Frequency	Percentage	Cumulative percentage	P-value
With awareness	46 cases	14.6 %	14.6 %	<0.001
Without awareness	269 cases	85.4 %	100 %	
Total	315 cases	100 %		

As presented in table 5, among the E.N.T cases of the study, incidence of awareness was 7.2 %, and these cases formed 9.8 % of the awareness cases in the study.

Table 5: Distribution of awareness under G.A cases among the E.N.T procedures in the study population:

Presence of awareness	Frequency	Percentage	Cumulative percentage	P-value
With awareness	5 cases	7.2 %	7.2 %	0.024
Without awareness	64 cases	92.8 %	100 %	
Total	69 cases	100 %		

Figure 2: Age distribution among the awareness under G.A cases in the study population:



Many studies conducted about awareness under general anesthesia in different countries, which shows the importance of this complication.

In 2014 , the 5th National Audit Project from Great Britain (NAP5), evaluated by the national

anesthetic activity survey in >2.7 million cases, reported an incidence of awareness of only 1:19,600 (0.0051 %) .(4) In our study the incidence of awareness in Wad Medani hospital was 1 : 7.5 (13.3 %) which is approximately 2613 times more than the British study .

Marco Cascella et al made a 7-year retrospective analysis in a large cohort of cancer patients who underwent surgery under G.A. Among the study population (21,099 cases), two patients who experienced awareness under G.A were detected (0.0095%). The study have been carried out from January 2007 to December 2013 in the Istituto Nazionale Tumori—Fondazione in Italy. (3) The incidence of awareness in our study was approximately 1400 times more than the Italian study In 2008

Michael S. Avidan et al have published a study in the New England Journal of Medicine about BIS (Bispectral Index) and awareness . In the study , among 2,000 patients the incidence of awareness was 4 definite awareness cases (0.2 %) .(5) The incidence of awareness in our study was approximately 66.5 times more than Avidan's study .

In Sudan, a research has been conducted by Dr. Imad Eldin Elkhair under supervision of Dr. Amna Mahmoud. The research was a comparison between awareness under G.A cases in Sudan Heart Institute and Khartoum Teaching Hospital in the period April – September 2010. (5)

20 % was the percentage of the awareness cases in the total population of the study. In Sudan Heart Institute the incidence of awareness was 7.5 % while in Khartoum Educational Hospital the incidence was 32.5 % .(6) These results were opposite to the expectations because cardiac surgery was more suspected for the incidence of awareness than the general surgery cases.

The incidence of awareness for the total study population in this Sudanese study was approximately 1.5 times more than our study. The incidence of awareness in Kartoum Educational Hospital was 2.4 times more than the current study study. The incidence in our study was 1.8 times more than the Sudan Heart Institute.

The data in our study have been analyzed using SPSS; for the incidence of awareness among the

study population P – value was less than 0.001 which has indicated that the data was highly significant.

It is concluded in the study that many factors caused this incidence of awareness include the decreased number of anesthesiologists , lack of proper funding for the hospital and anesthesia department , absence of anesthetic gases monitor sensors in the used anesthesia machine , and absence of anesthesia depth monitors .

The study has recommended maintaining proper funding for the hospitals and their anesthesia department , more job opportunities for anesthesiologists and other anesthesia providers , provision of modern anesthesia machines equipped with sensors to monitor the levels of inhalational anesthetics in the gas supply , improving the environment for storage of anesthetic drugs in the standard situations , provision of anesthesia depth monitors , maintaining analgesia intraoperatively for the patients , post-operative visits for the patients to evaluate the presence of awareness under G.A , and referral to psychological consultation for patients who suffered from psychological complications .

Conflict of interest statement:

The authors of this research review certify that they have NO affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

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