

Original Article

Incidence of post operative surgical site infection in thyroid surgery following single dose of prophylactic antibiotic

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Abstract

Surgical site infection after thyroid surgery is a less common incidence. Prophylactic antibiotic before surgery and empirical antibiotic therapy after surgery is a common practice in our country. But international guidelines do not suggest antibiotic in clean surgical procedure.

Aim: *To compare the incidence of surgical site infection after thyroid surgery with and without empirical antibiotic therapy.*

Method: *It was a cross sectional study, done from July 2010 to December 2010 in 3 medical college hospitals in Dhaka city. Total 100 cases were included in this study, 50 cases for study in which only single prophylactic antibiotic used half an hour before operation, 50 cases for control in which 7 days antibiotic used per orally in addition to prophylaxis.*

Result: *Among 100 cases male were 24 & female 76 (M: F= 1:3.2). Oldest patient was 56 yrs & youngest 21yrs. 47% patient operated for solitary thyroid nodule, 35% multinodular goiter & only 6% diffuse goiter. 47% patient was done hemithyroidectomy & only 7% total thyroidectomy. All the operations were completed within 2 hours where 40% within one hour. No surgical site infections were found in both study and control cases.*

Conclusion: *There is no statistical difference between routine antibiotic use and no use of antibiotic after thyroid surgery.*

Key word: *Surgical site infection, thyroid surgery, antibiotic prophylaxis*

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Introduction

Surgical site infection is an infection occurring within 30 days after an operation or within 1 year if an implant is present¹. It may be an incisional or organ/space manipulated during operation². It has enormous impacts on patient's quality of life. It delays recovery, increases length of stay in the hospital and needs extra resource for investigation, management & nursing care³.

Surgical site infections make up the largest single group of postoperative infective complications of surgery. They are the second most frequent type of nosocomial infection. It is usually polymicrobial and treatment is with appropriate drainage and multi-antibiotic regime. Prophylactic administration of

antibiotics can decrease surgical site infections, thereby decreases postoperative morbidity, shorten hospitalization and reduce overall costs attributable to infections⁴.

Prophylaxis includes selection of appropriate antibiotic, adequate dose, proper time and proper routes of administration of antibiotic. It should provide effective levels of antibiotics at the time of wound exposure. Many antimicrobials require a single dose given before 30 minutes of skin incision to provide adequate tissue concentration throughout the operation. Additional doses during the procedure are advisable if surgery is prolonged (> 4 hours), major blood loss occurs, or an antimicrobial with a short half-life is used⁴. The prophylaxis should be directed against the most likely infecting organisms. Only those organisms commonly cited as pathogens need to be eradicated⁵.

Thyroidectomy is a clean surgical procedures, those where there is no intra-operative bacterial contamination following surgery⁶. Post-operative surgical site infections are an uncommon finding after thyroidectomy⁷. For these reasons international guidelines do not routinely recommend systemic antibiotic prophylaxis⁵. Although many different guidelines of the National Health Service and of Surgical Societies include these recommendations, systemic antibiotic prophylaxis is nonetheless frequently used in thyroid surgery⁸. According to the majority of surgeons, this conduct is justified with the potential risk of infections related to the positioning of drains. But there is no statistically significant benefit was found in thyroid surgery with drain and antibiotic prophylaxis⁹.

In thyroid surgery uses of antibiotic causes excess cost and other issues such as side effects, development of resistant strains and contribute to superinfection. The excess use of antibiotics may encourage laxity of good surgical technique.

Though there is a debate regarding the uses of single dose of prophylactic antibiotic in preventing surgical site infections in thyroid surgery, some studies shown that there is no significant difference between uses of single dose of prophylactic antibiotic and without antibiotic¹⁰.

The aim of this study is to see the single dose of cefuroxime preventing surgical site infections in thyroidectomy. Thus it helps to decrease the cost of thyroid surgery and to increase the awareness amongst surgeons about unnecessary over use of systemic antibiotics.

Methods

It was a prospective interventional non randomized clinical trial from July 2010 to December 2010 in 3 medical college hospitals (Uttara adhunik medical, Dhaka medical, Bangladesh medical) in Dhaka city. Total 100 cases were included in this study, 50 cases for study in which only single prophylactic antibiotic used half an hour before operation, 50 cases for control in which 7 days antibiotic used per orally in addition to prophylaxis (inj. Cefuroxime 1.5gm). Different type of thyroid surgery like Hemithyroidectomy, subtotal thyroidectomy, Near total thyroidectomy or Total thyroidectomy were done under endotracheal intubation carried out by surgeons of varying experience. In the postoperative period, sign and symptoms of surgical site infection were evaluated in all patients.

Results

In the present series 50 study cases of thyroidectomy patient with single dose of prophylactic antibiotic and 50 control cases with conventional uses of 7 days antibiotic, total 100 cases were studied. The series was composed of 10 male and 40 female in control group and 14 male and 36 female in study

group. Age of the youngest patient was 21years and of oldest one was 56years. Highest number of patients 17 and 18 respectively in the study and control group was in the 20-30yrs and 31-40 years age group. Highest number of operation 22 and 28 respectively in study and control group was subtotal thyroidectomy and Hemithyroidectomy and lowest 4 near total and 2 total thyroidectomy respectively. Maximum 47 patients were operated for solitary thyroid nodule and one case was medullary carcinoma in thyroid. Maximum operative time was two hours where 40% within one hour. There was no major complication in this series. Surgical site infections were not found in both study and control group.

Table-I
Distribution of patient by sex: (n-100)

sex	study	control	total	%
Male	14	10	24	24
Female	36	40	76	76
total	50	50	100	100

In this series most of the patient (76%) were female, Male were 24%. Male & female ratio is 1:3.2.

Table II
Distribution of patient by age: (n-100)

age	study	control	total	%
20-30	17	13	30	30
31-40	14	18	32	32
41-50	11	14	25	25
51-60	8	5	13	13

In this study, maximum patient(32%) were 31-40 yrs age group, Only 13% were in 51-60yrs age group.

Table III
Indication of operation: (n-100)

indication	study	control	total	%
Solitary nodule	19	28	47	47
Multinodular goiter	21	14	35	35
Diffuse goiter	2	4	6	6
Papillary carcinoma	5	2	7	7
Follicular neoplasm	3	2	5	5
Total	50	50	100	100

Solitary nodular goiter was the commonest(47%) indication in the study and Multinodular goiter was 35%.

Table IV
Types of operation: (n-100)

operation	study	control	total	%
Hemithyroidectomy	19	28	47	47
Subtotal thyroidectomy	22	17	39	39
Near total thyroidectomy	4	3	7	7
Total thyroidectomy	5	2	7	7
Total	50	50	100	100

47% of the patient underwent Hemithyroidectomy and Only 7% done total thyroidectomy in this series.

Table V
Histological diagnosis (n-100)

Dx	study	control	total	%
Nodular goiter	41	44	85	85
Papillary carcinoma	6	3	9	9
Follicular carcinoma	2	2	4	4
Follicular adenoma	1	0	1	1
Medullary carcinoma	0	1	1	1
Total	50	50	100	100

In this series, 85% patient were nodular goiter and 14% were carcinoma thyroid.

Table VI
Postoperative complications (Related to operation)

Complication	study	control	total	%
Temporary voice change	0	1	1	1
Respiratory distress	0	0	0	0
Heamatoma	0	0	0	
Hypocalaemic tetany	1	0	1	1
Total	1	1	2	2

There was no major complications in this series. One patient in control group changed voice temporarily which was recovery after one month.

Another patient in study group showed hypocalaemic tetany which was corrected conservatively.

Table VII
Postoperative complications : (Related to SSI)

Complication	study	control	total	%
Redness	5	4	9	9
Pain	42	46	88	88
Fever	02	05	7	7
Swelling	0	0	0	0
Discharge	0	0	0	0
Wound gap	0	0	0	0

In this series, after first dressing change redness in the incision mark were found 5(five) cases in study group and 4(four) cases in control group but other sign of infection were absent. Another 2 cases in study and 5 cases of control were complaints of raising temperature with normal looking incision mark. About 88% patients were complaints mild pain in the neck.

Discussion

Although the majority of international guidelines do not recommend the use of systemic prophylactic antibiotic treatment, this practice is adopted sporadically in some nations and routinely in others ¹¹. In our country, almost all surgeons are using of prophylactic antibiotic preoperatively and postoperative antibiotic therapy.

Thyroid surgery is classified as a clean procedure and is associated with a low incidence of surgical site infections (0, 3%)¹². A prospective analysis on 241 thyroidectomy patient in Italy was carried out and surgical site infections were found only 2% ¹³. Another study in same University of Insubria in Italy on thyroidectomy patient was found surgical site infection 2.6% ¹⁴.

In our study, it is found that there was no surgical site infection both in study and control group but some patient had few inflammatory signs such as redness in the incision area, pain and fever.

Redness in the incision area was found in 5(five) cases in study group and 4(four) cases in control group. It was found during first dressing change (48hrs). No other sign of infection was found in these cases and redness disappeared after three days. So it was not related to SSI.

Some patient is complaints of raised temperature. Two patient in study group and five cases in the control group had complaints of it but other sign of SSI were absent. In all these cases, temp raised in first post operative day and treated by simple antipyretics, systemic antibiotic was not needed.

About 88% patients had mild pain in the neck (42 in study and 46 in control group) and managed by simple painkiller. No swelling or discharge found in this group.

All above postoperative complications were not related to SSI, it may be postoperative inflammatory reaction. All these complications were managed conservatively, systemic antibiotic was not used.

In this series, there was no major complication occurs. In study group hypocalcaemic tetany occurred in one case which underwent total thyroidectomy and another cases in control group had temporary voice change which was recovered after one month.

In common clinical practice it is believed that the use of drains after thyroidectomy represents a risk factor for the development of infective complications of the surgical wound. This notion is not supported by clinical data, whereas conflicting evidence was presented recently in a systematic review by Samraj e Gurusamy ¹⁵. This review of the literature has evidenced 5 RCT in which 337 patients with drains were compared with 350 patients without drains following thyroidectomy; the statistical analysis failed to evidence that patients with drains show a significant incidence of infections of the surgical wound.

In our study, all the patient both study and control group were inserted negative suction drain which removed after 24 hours. In both group same result was found. Therefore antibiotic therapy does not seem to be beneficial in all patients with drains ¹⁶.

Conclusion

In our series, no surgical site infection occurs in both groups. So, antibiotic treatment after thyroidectomy is not beneficial for the patient.

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