



Antibiotic Prophylaxis for Thyroid Surgeries: A Single Day versus Five Day Antibiotic Regimen

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Abstract

With the use of prophylactic antibiotics in surgical procedures, the rate of wound infection has been decreased significantly compared to the pre antibiotic era. However, there is no consensus about the duration of antibiotic usage in different part of the world. Prolonged antibiotic usage may not only incur extra expenditure on the patient, along with the prolonged hospital stay, it also can be a potential risk for developing antibiotic resistance. This is a study, attempted to emphasize the optimal usage of antibiotic prophylaxis, by comparing a single day regimen versus a five day regimen.

Keywords: Prophylactic antibiotic; Thyroid surgery; Single day; Five days

Introduction

The prophylactic use of antibiotics in thyroid surgeries is routine practice in many institutions across India. This routine practice is justified with the potential risk of infections either due to the persistence of a neck drain or stay in the hospital. The rationale of using prophylactic antibiotics in the post-operative period is to reduce the possibility of infection arising from the surgical site [1]. Thyroidectomy is classified as a clean head and neck procedure which is predominantly elective. Infection rates in elective clean procedures of the head and neck region account for only 1 percent of surgical site infections [2,3]. The ambiguity which exists in the length of postoperative antibiotic prophylaxis for thyroid surgeries results in both financial burden and prolonged hospital stay. The rate of wound healing in the postoperative period is dependent on the patient's age and co morbidities [4]. Factors induced by surgery such as sepsis of the surgical site, duration of hospital stay, duration of the surgical procedure, the use of drains or even the need for tracheostomies could add to an increased rate of surgical site infection [5,6]. The majority of these circumstances are often avoidable or surgeon dependant. With no conclusive evidence in literature highlighting the advantages of antibiotic prophylaxis we evaluated the incidence of post-operative wound infection rates in patients who underwent thyroid surgeries in our tertiary care referral hospital, by comparing a single day perioperative antibiotic course compared to that of five days.

Materials and Methods

In a comparative study done in a tertiary care centre from December 2015 to January 2017, patients undergoing thyroid surgeries were selected. This included patients posted for either a hemi or total thyroidectomy. The inclusion criteria for the study composed of individuals aged between 20 and 60 years undergoing an elective thyroid surgery. Patients who were diagnosed with diabetes, anaemia or an immunosuppressive state were excluded from the study due to a correlation between these factors in delayed wound healing. Individuals who had an FNAC report suggestive of malignancy of the thyroid were also excluded. This was due to an anticipated prolonged surgery and the possibility of neck dissection. The patients were selected at random into either Group A or Group B. With patients in Group A receiving an injection of one gram ceftriaxone approximately two hours prior to surgery and twelve hours following the procedure. While candidates in group B received a five day antibiotic regime with ceftriaxone being started 24 h prior to surgery and the antibiotic regime continuing every twelve hours for five consecutive days. All of the procedures were carried out according to the general rules of sterility and performed by the consultant surgeon. All wounds were irrigated with normal saline before closure. The surgical site dressing was covered with a local application of ciprofloxacin ointment over which sterile gauze was placed and covered with dynaplast. The surgical dressing was removed on post-operative day three. Following which no dressing was placed over the surgical site. Daily monitoring of temperature every 8th hour was done

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and the operative site was evaluated on postoperative day 3, 5 and 7. The skin over the surgical site was assessed, for gaping, discharge, inflammation. All patients had a negative suction drain which was removed on the postoperative day two or three depending on the drain output being less than 10 ml. Absorbable monocryl 3.0⁺ sutures were removed on post-operative day 7.

Results

A total of fifty patients were included in the study. Two patients who had prolonged procedures lasting more than three hours were shifted from group A to group B to follow the earlier mentioned guidelines. All the patients in both group had an uneventful post-operative period. The wound healing was good in all the patients. There were no signs of infection noticed in either group. No noticeable difference in the wound healing of the patients in either group was noted. Follow up after a period of 1 month showed no difference in either group.

Discussion

Thyroidectomy is one of the common surgeries performed in otolaryngology practice. Antibiotic prophylaxis is a routine practice to prevent surgical infection which is followed world-wide. In India most of the institutions follow a course of intravenous antibiotics in the perioperative period for duration of three to seven days which would incur a larger hospital expense for the patient. The use of a third generation cephalosporin, ceftriaxone was due to its broad spectrum of action and affordability. Esposito S et al. [7] studied 17 565 patients comparing ceftriaxone with other antibiotics for clean surgeries between the period of 1984-2003, suggested a surgical site infection rate of less than 5.1% compared to the 6.2% in the comparator group. This showed statistical superiority over other antibiotics used.

Timing of the administration of antibiotics prior to surgery is debatable as it could result in wound site infection. Classen DC et al. [8] conducted a study with 2847 patients and monitored the timing of antibiotic prophylaxis to study the incidence of surgical-wound infections in patients undergoing elective clean surgical procedures. Pre-operative antibiotics administration showed only a 0.6% chance of infection. In comparison with antibiotics administered perioperative and post operatively showed a higher level of infection with 1.4% and 3.3% respectively. Systemic antibiotics prior to incision showed the best results, hence resulting in our inclination towards using preoperative antibiotics. Cleanliness of the hospital, surgical technique, immunological dysfunction, anaemia, longer operative times and wide surgical field all could possibly contribute to delayed wound healing and an increased surgical wound infection rates [11-14]. Lilani SP et al. [15] in a study conducted between May 2001 and July 2002, studied the rate of surgical site infection (SSI) in clean wound procedures. The study showed a surgical site infection rate of 3.03% in clean surgeries. There was an increase in surgical site infection rate with an extended pre-operative stay. Surgical site infection rate was higher (22.41%) when a drain was used. In our study however we had no surgical site infections for any of the patients even though each patient undergoing thyroidectomy had drain insertion. In other similar studies conducted in India by Shrivastava et al. [16], Shaw et al. [17] and Desa LA et al. [18] showed an infection rate of 10.19%, 16.9% and 18.92%. In a similar study to ours done by Thejeswi et al. [19], with a study sample of 57 yielded the similar results. They adopted the use of prophylactic ceftriaxone over a period of seven days postoperatively in group B

compared to our five days. There was however no difference in the rate of post-operative infections in either group. A notable study was done by Johnson and Wagner in a retrospective analysis of 354 patients who had undergone clean, uncontaminated head and neck surgery excluding neck dissection, none of the participants received antibiotic therapy. The postoperative wound infection rate was 0.56 per cent which led to a conclusion that prophylactic antibiotics are an unnecessary formality for this group of patients. Although antibiotic prophylaxis is much debated as per our study there are no additional benefits in prolonging antibiotic administration. A lack of protocols regarding the fixed antibiotic regimen in thyroidectomies leads to blind practices which could result in financial burden, prolonged hospital stay and harbours the possibility of antibiotic resistance.

Conclusion

Even though the antibiotic prophylaxis for thyroidectomy is proved essential, the cost of prolonged intravenous medication along with an extended hospital stay is of concern to the patient due to financial and time constraints. We conclude, a single day course of antibiotic prophylaxis is equally effective to that of a prolonged antibiotic regimen, when due surgical asepsis is maintained.

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