Title

How effective is an assessment of Timeliness of pre op antibiotic prophylaxis administration.

Reason for the choice of audit

Surgical site infection continue to be a major public health problem that imposes enormous impacts both on patients' life and substantially to the financial cost of patient care. Administering antibiotic prophylaxis at the appropriate time, contributes a lot to prevent SSIs than other methods.

Our institution has an average of 450 elective surgeries per month. Staff nurses administer prophylactic antibiotics during time of transfer of patient to the operation theatre. Though having a well established pre op antibiotic prophylaxis protocol in our hospital and the time frame for administration is considered as 60mts prior to skin incision Most of the time we found there is low adherence to the pre- op antibiotic prophylaxis protocol due to various underlying factors highlighting a need for quality improvement. Therefore this study is aimed to assess the timeliness of administration of the first dose of prophylactic antibiotics in elective surgeries.

Criteria

The literature supports at least 30 minutes, but no greater than 60 minutes before the skin incision is made as the optimal timing for the pre-operative administration of most commonly used antibiotics

Standard set with rationale

90% of patients undergoing surgery will be administered pre-op antibiotic prophylaxis with in 60minutes of skin incision. The rationale is to allow time to establish adequate tissue and serum antibiotic levels by the time of skin incision

Preparation and Planning

This quality improvement initiative aimed to identify gaps in low adherence to pre op antibiotic prophylaxis and to work towards achieving minimum of 90% compliance with pre operative antibiotic administration. An active audit was done to assess the present compliance and to identify the reasons for low adherence to the protocol. Subsequently measures for improvements are

planned and implemented. Later on impact of the change will be audited and measures are taken to sustain the improvement.

Methodology

An active audit of 500 cases and medical records of patients underwent elective surgeries during the month of January 2021 to April 2021 were done randomly. Post implementation an active audit of 500 elective cases and files were done during the month of May 2021 to September 2021. And compared with the pre implementation status.

Inclusion criteria:

All the patients admitted for elective surgery are included in the study.

Exclusion criteria

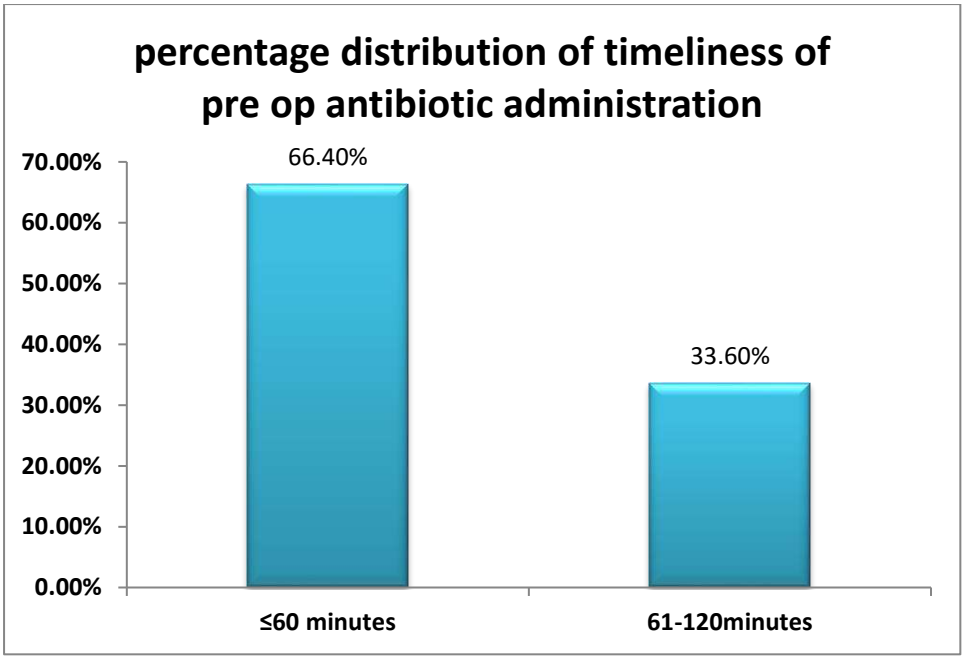
Patients who underwent emergency surgeries and those who were already on antibiotic were excluded from the study.

Data collection method

Timing of administration of preoperative antibiotic was captured from medication administration record and incision time was noted from surgeon's operation record as well as nursing operative record. And the difference between these two timing is calculated to identify the time duration between the administration of antibiotic and skin incision. And observational study and staff interview was conducted to identify the factors contributing to low adherence to the timeliness of preoperative antibiotic prophylaxis.

Findings

All data collected were analysed. Out of 500 cases 66.40% (332) of patients received prophylactic antibiotic within 60 minutes of skin incision. From the records it was evident that all first cases which started at 8:00am received prophylactic antibiotic within 60 minutes of skin incision. However 33.60% of them received prophylactic antibiotic within two hour of skin incision. This demonstrates the inappropriateness of timing of pre operative antibiotic prophylaxis in our practice.



After examining the existing operation theatre workflow some causes that were identified included lack of knowledge regarding timing of the antibiotic prophylaxis, difficulty in anticipating the incision time, uncertainty regarding completing the previous surgery, shortage of potters to transfer the patient to OT and lack of proper scheduling of cases in OT. Lacunas In addition to these there are other factors which contribute to this delay are: ward nurses were informed to shift the cases to OT too early in order to prevent the unforeseen delay from the ward. This causes a prolonged duration between the antibiotic prophylaxis administration and skin incision. All the first cases scheduled at 8:00am received preoperative antibiotic prophylaxis within expected time frame ie with in 60 minutes prior to skin incision. And subsequent cases were being shifted to OT without considering the cleaning time required for OT, or even before completing the ongoing case.

Recommendation

We embarked on a quality improvement initiative to achieve a minimum of 90 % compliance to preoperative antibiotic prophylaxis protocol. The measures taken are :

- Educated staff on the importance of timely antibiotic administration and need for compliance through department meetings and emails;

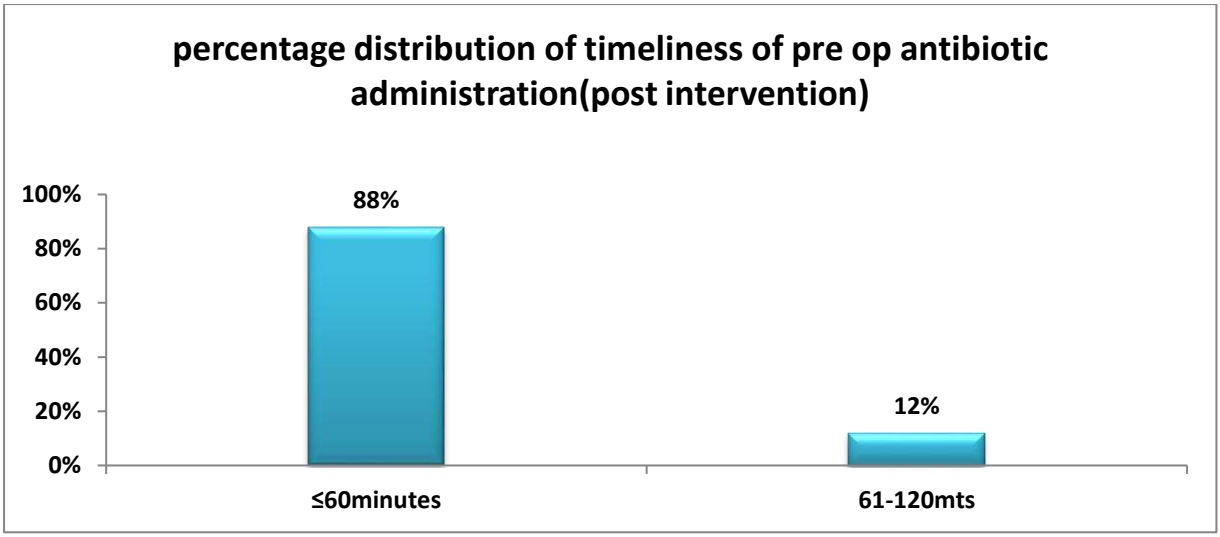
- Strengthened OT scheduling process in collaboration with surgeons and nurses. It became a NURSE LED SURGEON INTERVENED PROGRAMME.
- Scheduling was done by considering Time for disinfection of the OT after each case.
- Call for the subsequent cases were done after anticipating the incision time, after consultation with the surgeon.
- Extra porters were recruited to facilitate on time transfer of patients .
- Departments which have 100% compliance to prophylactic antibiotic were given special appreciation during OT committee meeting.
- Quarterly review of adherence to preoperative antibiotic prophylaxis protocol was done OT committee meeting.

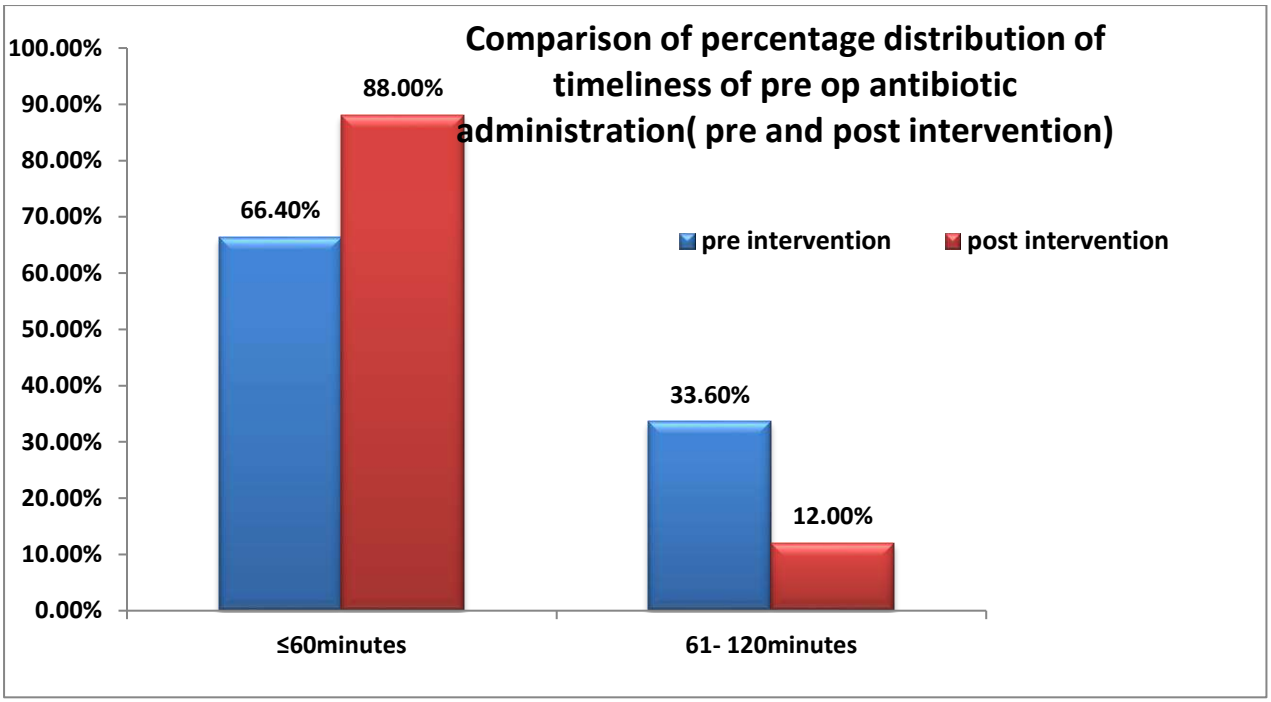
Follow up and evaluation of change

During this phase, there was ongoing data analysis and surveillance, and identification of areas where there was lack of compliance, with feedback provided to staff. Prospective audit of patient's records helped us to identify the time duration between administration of pre op antibiotic and skin incision. Delays were communicated to each department. Lacunae found in the OT scheduling process were modified. Subsequent cases were called only after anticipating incision time. Timely interference where there is delay helped to identify the root cause and prevent the future occurrence.

Impact of audit

To evaluate the success of the new change, we compared the adherence to timeliness of pre op antibiotic administration within 60 minutes of skin incision pre- and post implementation. To assess the post implementation status we prospectively audited 500 cases of elective surgeries during May 2021-September 2021. The number of patients who achieved the target were 88% (440).There was a remarkable improvement in the adherence to antibiotic prophylaxis when compared to the pre implementation phase. An improvement of 21.6% in the post implementation phase. However 12% of them did not receive the preoperative antibiotic prophylaxis with in 60 minutes of skin incision.





Though there was a very well established OT scheduling process existing, in few cases surgery did not complete on time as expected this led to the delay in starting the next case which eventually contributed to non adherence to the antibiotic protocol.

Conclusion

This audit helped us to identify and address novel problems that were not apparent initially and left unnoticed as well. We learnt that for change to be

sustained, it should be incorporated into a pre-existing workflow in a seamless manner, maintaining ease of use and without compromising efficiency.