

Is The Use Of Antibiotics Post-Operatively Imperative? A Pilot Study To Assess The Value Of Post Operative Antibiotics

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Abstract

This is a comparative clinical trial between two groups of patients having undergone different types of operations one groups received antibiotics post operatively and the other group did not. The total sample consisted of 430 patients.

The occurrence of wound infection post operatively with a 14 day follow up was used as a criterion to assess the value of administering antibiotics post operatively.

Statistically, no significant difference was found between infection rates of the two groups.

Introduction

Wound infection is a particularly important problem following surgery. It comes second in frequency among nosocomial (hospital acquired) infection after urinary tract infections⁽¹⁾.

It entails additional suffering to the patients, additional effort on the part of the staff, and a sharply rising cost burdening the health authority's budget.

An important item contributing to this rising cost is the use of antibiotics routinely after surgery, and the problem of increasing resistance to these antibiotics⁽²⁾.

Some surgeons argue that the type of operation influences the decision whether to use or not to use antibiotics post operatively, for example clean incisions such as herniorrhaphy; potentially contaminated operations such as cholecystectomy and peptic ulcers; and contaminated operations such as appendectomy and colon surgery⁽³⁾.

Our aim in this pilot study is to assess whether the routine use of antibiotics post operatively is justified from the point of view of sparing the patient the misfortune of having a wound infection.

Material and Methods

Over a period of seven months (from 1st Jan. 1990 till 31st July 1990), 430 patients were operated upon by the same surgeon in Hilla Surgical Hospital. These patients were divided to two groups:

Group A: Received antibiotics: 127 patients .

Group B: Did not receive antibiotics : 303 patients.

The three types of operations were included in the two groups (i.e clean, clean-contaminated, and contaminated operations), cases of perforated appendix were excluded from the study.

Preoperative preparations

All patients included in the study were admitted preoperatively for a period between zero and five days (for cases of toxic goitre) during which no antibiotics had been administered.

No peroperative antibiotics were used for either groups as well.

Surgical Handwash

Prior to the operation, the surgeon make sure each time that proper scrubbing of the hands was carried out using a simple bar soap and water with a disinfected brush. Scrubbing is carried out for five minutes for the first operation of the day, and for three minutes for subsequent operations. No further means were employed.

Preparing the field

The site of the operation field is shaved where appropriate on the same day of the operation.

The patient's skin is then disin-

fecting using iodine and spirit⁽⁴⁾.

Drains

The use of a corrugated drain was restricted as much as feasible.

Post-operatively

Group A patients received antibiotics (such as Ampicillin, Garramycin, Flagyl and other appropriate antibiotics). While, Group B did not receive any. The dressing of the wound was not opened until the day of removing the stitches (according to the type of operation).

Follow up

Follow up was carried out for members of both groups throughout their stay in hospital and after their discharge for up to 14 days post-operatively.

Infection was diagnosed by the presence of redness, tenderness, with or without discharge and with the results of culture and associated fever⁽³⁾.

Results

Operations carried out were codified and the patients were randomly allocated to the two groups (Group A receiving antibiotics, Group B not receiving antibiotics). See Table I.

The two groups were matched by age, sex, occupation and other personal variables.

Table I. Classification of Operations and allocation of patients

Operation	Classification	A	B	Total
Inguinal hernia	I ⁽¹⁾	24	47	71
Epigastric and umbilical hernia	I ⁽²⁾	15	32	47
Appendicectomy	II	39	57	96
Cholecystectomy	III	3	7	10
Renal operations	IV	7	1	8
Skin lesions and lipoma	V	2	11	13
Thyroidectomy	VI	10	113	123
Others	VII	27	35	62
Total		127	303	430

Note: Class VII "Others" includes Breast mass + Mastectomy, Prostatectomy and Ovarian cyst.

Distribution of patients in the two groups by age revealed a higher concentration of patients between the ages of 11 and 50, fewer patients were encountered at the two extrem-

ities of age (Table II). So the young adult, and mature adult patients formed the majority. Patients were evenly distributed in the two groups.

Table II. Distribution according to age

Age Operation	1-10	11-30	31-50	Over 50	Total
I ⁽¹⁾	15	10	26	20	71
I ⁽²⁾	1	10	30	6	47
II	4	80	12	-	96
III	-	-	8	2	10
IV	1	2	1	4	8
V	-	3	8	2	13
VI	-	68	50	5	123
VII	7	18	27	10	62
Total	28	191	162	49	430

As expected, patients in both groups showed different frequencies in each category of operations according to the sex of the patient, for example a higher percent of Inguinal hernia (91.5%) in the males, while

the females showed a higher percent of umbilical and epigastric hernia operations (74.5%), cholecystectomies (80%) and thyroidectomies (93.5%). (See Table III).

Table III. Distribution according to sex

Sex Operation	Male		Female		Total
	No.	%	No.	%	
I ⁽¹⁾	65	91.5%	6	8.5%	71
I ⁽²⁾	12	25.5%	35	74.5%	47
II	50	52.1%	46	47.9%	96
III	2	20.0%	8	80.0%	10
IV	5	62.5%	3	37.5%	8
V	9	96.2%	4	30.8%	13
VI	8	6.5%	115	93.5%	123
VII	24	38.7%	38	61.3%	62
Total	175	40.7%	255	59.3%	430

The rate of of infection found in group A (receiving post operative antibiotic) was 1.6%, while the infection rate in group B (not receiving antibiotics post operatively) was approximately 4%. However, on

carrying out statistical analysis on this data, it was established that this difference in infection rate is not significant statistically ($P > 0.10$) (See table IV).

Table IV. Administration of Antibiotics

Operation	Received Antibiotics (Group A)				No Antibiotics (Group B)			
	Developed Infection		No Infection		Developed Infection		No Infection	
	No.	%	No.	%	No.	%	No.	%
I ⁽¹⁾	-	-	24	100%	3	6.4%	44	93.6%
I ⁽²⁾	-	-	15	100%	-	-	32	100%
II	-	-	39	100%	5	8.8%	52	91.2%
III	1	33.3%	2	66.7%	-	-	7	100%
IV	-	-	7	100%	-	-	1	100%
V	-	-	2	100%	-	-	11	100%
VI	-	-	10	100%	4	3.7%	109	96.3%
VII	1	0.7%	26	96.3%	-	-	35	100%
Total	2	1.6%	125	98.4%	12	4%	291	96%

X = 2.412

D.F. = 1

P > 0.10 Not Significant

Table V. The Use of Drain

Drain Operation	With Drain		No Drain		Total
	No.	%	No.	%	
I(1)	-	0%	71	100%	71
I(2)	30	63.8%	17	36.2%	47
II	9	9.4%	87	90.6%	96
III	10	100%	-	0%	10
IV	8	100%	-	0%	8
V	3	23.1%	10	79.9%	13
VI	123	100%	-	0%	123
VII	27	43.5%	35	56.5%	62
Total	210	48.8%	220	51.2%	430

Table VI. Follow up: Apperarace of Wound infection after Seven Days

Operation	Infection	No Infection	Total
I ⁽¹⁾	3	68	71
I ⁽²⁾	-	47	47
II	5	91	96
III	1	9	10
IV	-	8	8
V	-	13	13
VI	4	119	123
VII	1	61	62
Total	14	416	430

In just over half the cases in both groups, a drain was not put (51.2%) while the rest were supplied with a drain post operatively where it was obligatory and according to the type of incision (See Table V).

All cases of wound infection in both groups appeared within 7 days after the operation totalling 14 cases and giving an overall rate of wound infection of 3.24% (Table VI). No

further cases of infection were found on reexamination after 14 days post operatively.

The median number of days in each type of operation till removal of stitches in both groups was similar and is summarized in Table VII. The range being from 4 days for thyroidectomies up to 9 days for cholecystectomies.

Table VII. Removal of Stitches

Operation	Median No. of days of stitches
I ⁽¹⁾	5
I ⁽²⁾	7
II	6
III	9
IV	8
V	7
VI	4
VII	7

Discussion

From the foregoing results we can see that both groups in the sample came from the same population showing a normal range of distribution according to age and sex.

The statistically proven lack of evidence that antibiotics given post-operatively reduce the rate of infection, shows that the most important factors contributing to a reduction in surgical wound infection rate, in any type of incision, are:

- 1- A sufficiently through hand scrub for the surgeon and his team⁽⁴⁾.
- 2- A carefully prepared and disinfected field⁽⁵⁾.
- 3- Standardized acceptable techniques of sterilization of surgical instruments and material tested regularly.
- 4- A reduction in the use of drains whenever feasible.
- 5- Keeping the wound dressed till stitch removal days-unless otherwise indicated.
- 6- A keen follow-up post operatively even after the patient leaves the hospital, up to 14 days or more if necessary, ensures detection of all cases of surgical wound infection even when they had gone back to the community bearing with them this nosocomial infection cruse (1981)⁽⁶⁾

recommended a follow up of up to 28 days.

By all accounts, it is well known and proven that antibiotics add tremendously to the cost of surgical wound infection⁽⁷⁾.

The overall rate we have obtained for the groups or the separate rate for each group is relatively low, both groups have a rate below the 5% (acceptable limit) of nosocomial infection (1.6% for group A, 4% for group B, and 3.25% as an overall rate) while in Alexandria 1983 they found the surgical wound infection rate to be 49.31% and in 1984 it was 49.18% which are shocking figures⁽⁹⁾.

Conclusions and Recommendations

Good preoperative preparation, through scrubbing and careful and watchful post operative follow up, secure a higher probability of preventing surgical wound infections, the difference made by the use of antibiotics was insignificant in this study.

Therefore, we recommend restricting the uses of antibiotics post operatively as long as other hygienic measures are adhered to religiously by the surgeon and his team, and care is taken to supervise the appropriate sterilization of instruments and material, and the hospital environment is kept disinfected.

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هل استعمال المضادات الحيوية بعد اجراء العمليات الجراحية الزاهي ؟؟

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المضادات الحياتية بعد العملية روتينياً لمنع حدوث خمج جروح العمليات ومن خلال متابعة المرض ١٤ يوماً بعد اجراء العملية. ويستخلص الباحثان انه بالامكان الاستغناء عن اعطاء المضادات الحياتية بعد العملية اذا تم الالتزام التام في الظروف المناسبة للتعقيم والخطوات الجراحية الصحيحة المتخذة .

الخلاصة
تناولت هذه الدراسة المقارنة السريرية لـ ٤٣٠ مريض اجريت لهم عمليات جراحية مختلفة من قبل فريق جراحي واحد .
وقسم هذا العدد الى مجموعتين للمقارنة .
اثبت البحث ومن خلال الدراسة الاحصائية الطبية انه ليس ضرورياً اعطاء