EVALUATION OF THE USE OF ANTIBIOTICS AMONG PATIENTS ATTENDING DENTAL CLINIC AT KAMPALA INTERNATIONAL UNIVERSITY TEACHING HOSPITAL

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A RESEARCH DISSERTATION SUBMITTED TO THE SCHOOL OF ALLIED HEALTH SCIENCES IN PARTIAL FULFILMENT FOR THE AWARD OF DIPLOMA IN CLINICAL MEDICINE AND COMMUNITY HEALTH AT KAMAPLA INTERNATIONAL UNIVERSITY

JULY, 2017

DECLARATION

I **BAGALANA GEORGE**, declare that this research dissertation is my own effort and it has never been presented to any university or institution for any award or qualification. Where other people's work has been included in this dissertation, due acknowledgement has been given and citation to this has been made in accordance with the text and reference.

SIGNATURE…….DATE……

Bagalana George

DCM/0080/143/DU

SUPERVISOR'S APPROVAL

This research dissertation has been submitted with my approval as a supervisor.

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DEDICATION

I dedicate this piece of work to the family of Mr. Bateganya Moses and Mrs. Tibiri Annagoret, my parents, with the profound love. This piece of work too, is dedicated to Mugabo Godfrey, John kamwada, Kalenzi Stanley, Muwaya Steven and Rujara Smith for their unusual commitment to my education.

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Iam sincerely very grateful to all those who helped me to complete this research study. A special mention goes to my supervisor Mr.Kairania Emmanuel who guided me throughout my research.

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LIST OF ABBREVIATION

KIU-TH	Kampala International University Teaching Hospital
WHO	World Health Organization
HIV	Human Immune Virus
UK	United Kingdom
RNA	Ribo-nucleic Acid
DNA	Deoxyribo nucleic Acid
ANC	Antenatal Clinic
MCH	Maternal Child Health

DEFINITION OF OPERATIONAL TERMS

Dental caries: is a localized post eruptive pathological process of external origin involving progressive demineralization subsequent softening and proteolysis of the hard tooth structure resulting in formation of a cavity.

Extraction: The act of removing a tooth from its socket by use of instruments.

Endocarditis: Inflammation of the lining of the heart cavity and the valves.

Ludwig angina: Severe inflammation caused by infection of both sides of the floor of the mouth resulting into massive swelling of the neck.

Resistant microbes: Bacteria which are not responding to certain antibiotics which they used to.

Dental alveolar unit: Relating to the teeth and associated jaw.

Prophylaxis: Any means taken to prevent disease such as immunization against whooping cough to prevent dental decay in children.

Pulpectomy: A procedure in which part of the pulp of a tooth damaged by trauma or caries is cut back and then covered by medicament and restoration.

Scaling: This is the act of instrumental removal of calculus or hard tooth deposits.

Efficacy: The ability of the drug to produce a beneficial effect that may detect,relieve symptoms or a disease.

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ABSTRACT

Antibiotics are the most used medicines in dental practice (Lewis, 2008)and are used regularly for the management of oral and dental infection that originates from odontogenic infections (Dar-Odeh NS, et,al., 2010), however there is inappropriate use of antibiotics that result into gastrointestinal disturbances to fatal anaphylactic shock and development of resistance.

Methods used

The sampling was done at KIU-TH, employing simple random sampling; informed consent was sought from the patient and health workers at the dental clinic.

Results obtained

Signs and symptoms obtained in dental cases tooth ache at 43.16% was the most common symptom followed by painful chewing at 30.55% and others at 13.88%. the most used antibiotics were amoxicillin at 45.83%, metronidazole at 26.4%, clindamycin at 12.5% and others. The indications of antibiotics was majorly for odontogenic infections at 41.67% followed by prophylaxis of local infection like tumor surgery, tooth extraction at 33.33% and prophylaxis of infective endocarditis.

Conclusion and Recommendations

Some indications found in the study include odontogenic infections, non odontogenic infections, prophylaxis of infective endocarditis, prophylaxis of local infections where it also identifies common antibiotics used such as amoxicillin, metronidazole, clindamycin, macrolides, among them and also the symptoms such as painful chewing, fever, toothache and swollen gums which are tender. Appropriate antibiotic and prescription of antibiotics by dentists is urgently needed in view of the antibiotic resistance strains and occurrence of a biofilm of organisms in the oral cavity while combination therapy also works. Dental Infections, should first receive the appropriate local therapy with prevention which can sometimes be complemented with a systemic treatment with antibiotics. There is no literature to provide information about the antibiotic use at all levels.

CHAPTER ONE: INTRODUCTION

Dental conditions presenting with most patients require surgery or invasive interventions such as extraction, scaling,pulpectomy or filling with subsequent administration of antibiotics. Whereas most dental conditions are not life threatening, there is a tendency to bombard with antibiotics. prior to modern dental services, local procedures such as extraction were going on without serious complication. It is surprising that these procedures were done without administration of antibiotics or even proper post operative instructions. It is believed that with modern knowledge in clinical managements of dental conditions , situations may exist to do away with away with antibiotics as long as the patient is proven not to be at risk of certain conditions such as rheumatic heart disease. Post operative instructions such as warm saline water mouth wash, cotton pack in the socket for at least 30 minutes, not putting any thing in the socket, good oral hygiene and oral analgesics are sufficient.

1.1Background of the study

Antibiotic treatment is an aspect of pharmacotherapy with the particularity of affording both preventive and curative action. It was introduced in the mid-twentieth century in the form of sulfa drugs. Since then, people have focused much at clinical and pharmacological research, in response to the progressive challenges posed by bacterial infections: identification of new pathogens, the consolidation of new diseases, and novel clinical situations (increase in chronic processes, survival of patients with disorders considered to be fatal .) (Morcillo E, Cortijo J, 2008).

Antibiotics are generally prescribed for acute episodes and for brief periods of time, while the most heavily consumed medicines are those prescribed for chronic processes (antihypertensive agents like beta brokers, hypolipidemic drugs like statins, antacids like magnesium hydroxide, anti-inflammatory drugs like steroids, bronchodilators.).Bacterial infections are common in dental and oral clinical practice; as a result, antibiotics use prescribed for their treatment is also frequent. In Spain, it has been estimated that odontogenic infections are the cause of 10% of all antibiotics

prescriptions (Machuca M, Espejo, Gutierrez L, 2000) by pharmaceutical specialties or drug products, amoxicillin and the associated amoxicillin-clavulanic acid accounted for 67.8% of all prescriptions and 59.4% of the global cost.

The associated amoxicillin-clavulanic acid was the most frequently prescribed treatment, representing 38.7% of the prescriptions and 45.7% of the net cost. Spiramycin and the combination of spiramycin and metronidazole in turn accounted for 13.34% of the prescriptions and 10.2% of the global expenditure. Lastly, clindamycin represented 4% of the prescriptions and 4.2% of the costs. In total, three drug substances and two drug associations or combinations of the same three drug substances account for 95% of all antibiotic prescriptions made by dentists in the context of the public health care system, and 75% of the total antibiotic cost. The present study reviews antibiotics, used in dental practice, and contributes elements to favor the rational use of such medicines(Miloro , 2013)

Dentistry is a comprehensive speciality devoted to resolving dental infections or restoring and rehabilitating tooth structure lost to such bacterial processes. The use of antibiotics is an integral part of dentistry and prescribing antibiotics is a privilege that must not be abused. Irrational use of antibiotics will lead to an increased burden on the patient and the society by increasing treatment costs, and adverse events. Abuse of Antibiotics has already been considered as a pandemic community issue by World Health Organization (WHO, 2014)whilst the abuse of antibiotics by dentists is a worldwide problem (Goud SR, Nagesh L, 2012)

These oral infections can show themselves in an acute form (acute onset, quick evolution and evident signs and symptoms), or in a chronic form (slow onset and evolution showing less obvious signs and symptoms).They are classified as odontogenic and nonodontogenic. Odontogenic infections are the most frequent and begin affecting periodontal and dental structures. Non- odontogenic infections start in extra dental structures, such as mucous membrane, glands, tongue, (Rodriguez-Alonso E, 2009).

About 10% of prescribed antibiotics are used for treating oral infections. Antibiotics prescribing may be associated with unfavorable side effects ranging from gastrointestinal disturbances to fatal anaphylactic shock (NajlaSaeed Dar-Odeh, et.al., 2010)

1.2Problem Statement

Antibiotics are the most used medicines in dental practice (Lewis, 2008) and are used regularly for the management of oral and dental infection that originates from odontogenic infections (Dar-Odeh NS, et,al., 2010), however there is inappropriate use of antibiotics that result into gastrointestinal disturbances to fatal anaphylactic shock and development of resistance. The irrational use of antibiotics creates favorable conditions for resistant organism to appear and persist causing infections that do not respond to standard treatment (Mundial, 2012). The use of antibiotics in this way too, makes treatment expensive to the government and the patients especially the poverty stricken developing African countries (Mundial, 2012). A study at Sumba Mwanga government hospital dental department Tanzania showed that out of 4670 cases of dental conditions, 90% were for tooth extraction and discharged on antibiotics and analgesics.(Aseru Christine 2004).

Therefore this study will help to guide the stakeholders and policy makers in the formulation of prescribing guidelines in Uganda and Bushenyi Ishaka municipality thus at dental clinic in Kampala international university teaching hospital.

1.3 Justification of the Study

There is need to minimize the frequent use of antibiotics in situations where it is avoidable in order to protect them from resistance of microbes. Prescribing guidelines in the propers use of antibiotics should be advocated for to reduce government's expenditure of limited resources in poor African countries like Uganda. Thus at Kampala International University Teaching Hospital and is Further intended to provide data to other researchers who may pick interest in assessing antibiotics use in dental clinic. This prompted the researcher to carry out the study about the use of antibiotics in dentistry to provide adequate information about the subject.

1.4 Study objectives

1.4.1 Broad objective

Evaluation of the use of antibiotics among patients attending dental clinic at Kampala international university teaching Hospital.

1.4.2 Specific objectives

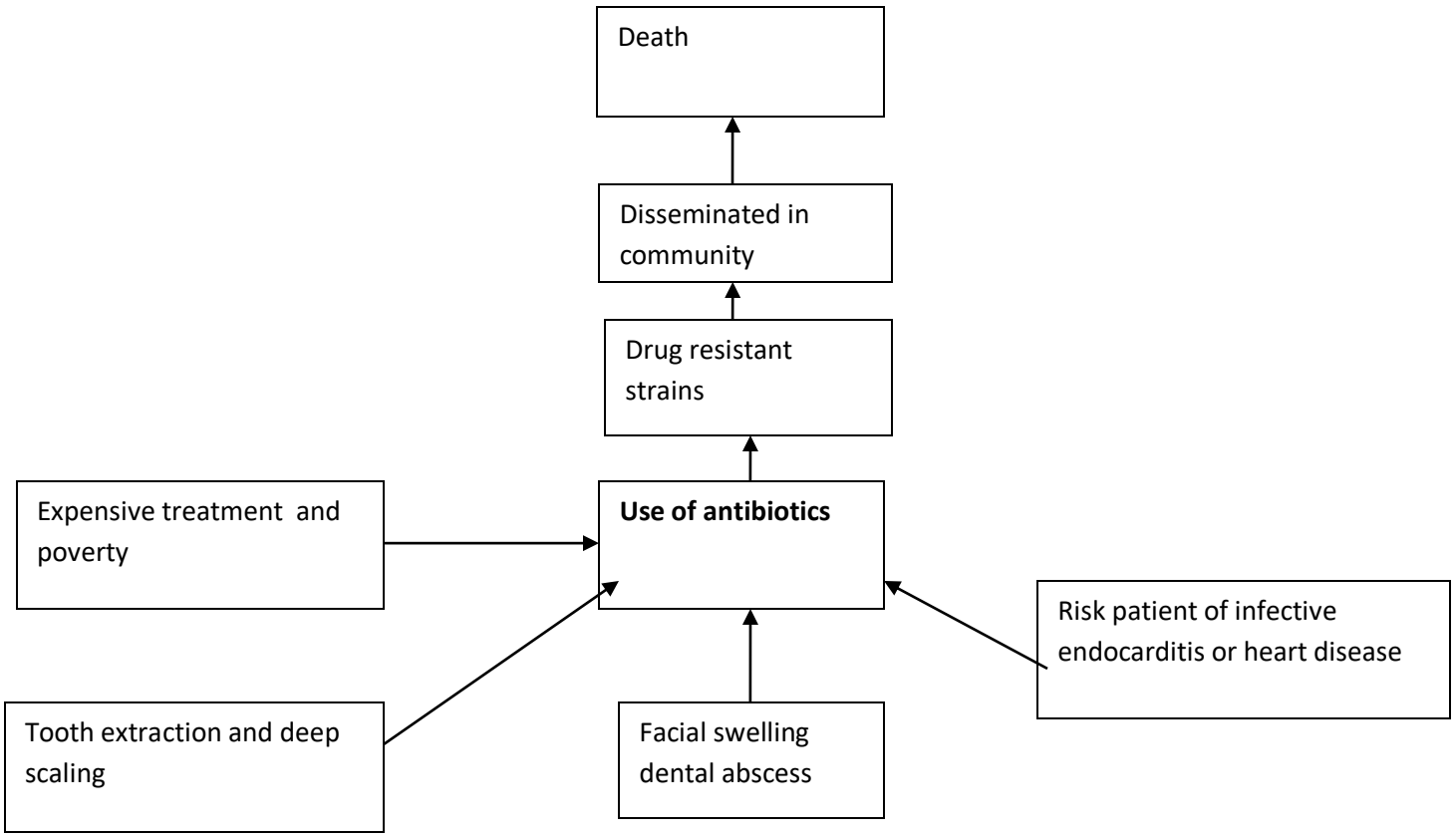
1. To identify the clinical symptoms and signs commonly presented by the patients attending dental clinic at Kampala international university teaching hospital.
2. To assess the commonly used antibiotics in dental clinic at Kampala international university teaching hospital.
3. To determine the reasons as to why these antibiotics are used in dental clinic at Kampala international teaching hospital.

1.5 Research questions

1. What are some of the presenting symptoms and signs for patients attending to dental clinic at Kampala International University Teaching Hospital?
2. What antibiotics are commonly used in dental cases in dental clinic at Kampala International University Teaching Hospital?
3. What are the reasons for the use of these antibiotics in dental clinic at Kampala International University Teaching Hospital?

1.6 CONCEPTUAL FRAME WORK

INDEPENDENT VARIABLES DEPENDENT VARIABle



CHAPTER TWO:

2.0 LITERATURE REVIEW

This chapter is explaining and giving more information about the specific objective in their order in chapter one.

2.1 Some of the presenting signs and Symptoms in Dental Cases

Severe, persistent, throbbing toothache.

The teeth and gums exhibit normal sensations in health. Such sensations are generally sharp, lasting as long as the stimulus. There is a continuous spectrum from physiologic sensation to pain in disease (Napeñas, 2013).

In a toothache, nerves are stimulated by either exogenous sources (for instance, bacterial toxins, metabolic byproducts, chemicals, or trauma) or endogenous factors (allodynia). (Hargreaves , Cohen , 2011)

Sensitivity to hot and cold temperatures.

This is thought to occur secondarily to exposure of the dentine to the external environment as a result of enamel loss or gingival recession. The pain is sharp and sudden, in response to an external stimulus; (Schmidlin, *et, a*l, 2012).

Fever. Fever in most cases is brought up to due to the inflammatory mediators but for this dental infection it is most times brought about by the bacterial invasion of the pulp cavity (Headings, 2013).

Painful chewing Pain is an unpleasant sensation caused by intense or damaging event(Hargreaves , Cohen , 2011).

Others include tender, swollen lympnodes under jaw or in your neck. Bad breath that do not go away. Sudden rush of foul smelling and foul tasting,foul testing,salty fluid in your mouth and pain (Figini L, *et,al*, 2007).

2.2 Some of the common Antibiotics Used in Dental clinic

Different antibiotics prescribing trends are in practice among dentists (Dar-Odeh N, *et,al.* 2008).Understanding the pharmacokinetics and pharmacodynamics is important for appropriate use of the antibiotics like amoxicillin, amoxicillin clavulanate, metronidazole, clindamycin, and others.

In spite of a large number of newer antibiotics being introduced in the market, there are a very few antibiotics that are useful in dental infections. Most infections of dental origin still respond to penicillin group of antibiotics,(Brescó-Salinas M, Costa-Riu N, Berini-Aytés L, 2006) and routine use of newer antibiotics only adds to the cost and risk of antibiotic resistance to these agents.

Aminopenicillins are not active against anaerobes but odontogenic infections that show anaerobic pathogenic bacteria still respond to these antibiotics and these antibiotics may act by changing the ecological niche that will result in death of the pathogenic anaerobes as well(Newman MG, 2001). Adding a drug with anaerobic cover like metronidazole, has a synergistic effect(Bratton TA, et,al., 2002).
Bactericidal antibiotics are preferred when the host is immune compromised. Bacteriostatic drugs require the host's immune system to completely eradicate the infection (Mani N, et,al., 2006)**.**

If the decision to prescribe an antibiotic is made, it may be necessary to use microbiological testing to choose the appropriate antibiotic. Microbiological testing by culture and sensitivity tests, will help choose the best antibiotic. Samples are collected in an appropriate manner after consultation with the lab and sent immediately, preferably before starting any antibiotics. After collection of sample, treatment should be started immediately by use of empiric antibiotics. For minor infections, amoxicillin or amoxicillin/clavulanate is sufficient. A combination of beta-lactamase resistant

penicillin group of drug and metronidazole is started in cases of serious odontogenic infections along with appropriate surgical therapy (Daramola OO, *et,al*, 2009).

Routine culture and sensitivity are not recommended in minor odontogenic infections. These infections respond well to empiric antibiotic therapy with penicillin group of drugs. It and so routine culture and sensitivity are not cost effective(Miloro M, 2013).

In case of severe infections or infections showing rapid spread, culture and sensitivity might be recommended. One must remember that "waiting is wasting" in these scenarios. Empiric antibiotic therapy is started and later changed, if necessary, based on culture and sensitivity reports.
Infections

.2.3 Indications of Antibiotics in Dental Clinic

Antibiotics are not an alternative to dental intervention; they are adjunct(Abbott PV, Hume WR, 1990).
Antibiotics are indicated when clinical signs of involvement are evident. The major use of antibiotic prophylaxis for dental procedures, are cases which cause bleeding in the oral cavity, has become a common practice among dentists(Tong DC, 2000). Antibiotics are indicated in dental practice for treating immunocompromised patients, evident signs of systemic infection and if the signs and symptoms of infection progress rapidly(Henry M, Al Reader, 2001).

2.3.1 Odontogenic infections

Penicillin is the drug of choice in treating odontogenic infections as it is prone to gram positive aerobes and intraoral anaerobes, organisms found in alveolar abscess, periodontal abscess and necrotic pulps. Both aerobic and anaerobic microorganisms are susceptible to penicillin. Penicillinase-resistant penicillin or an ampicillin like derivative is prescribed for infections caused by penicillinase-producing staphylococci or those involving gram-negative bacteria. A combinations of penicillin and clavulanic acid can be preferred for infections caused by staphylococcus, streptococci and pneumococci.

Patients allergic to penicillin are treated with clindamycin 300 mg (65%) which is the ideal drug of choice and followed by azithromycin (15%) and metronidazole-spiramycin (13%) (Henry M, Al Reader, 2001).

For cases of acute necrotizing ulcerative gingivitis requiring systemic antibiotic therapy in which penicillin is precluded, tetracycline are most beneficial. The side effects encountered most often by the usage of penicillin are hypersensitivity, which is found roughly in 3%-5% of the population (Henry M, Al Reader, 2001).

As with most antibiotics the occurrence of allergic reactions of all degrees of severity is common. The penicillins, followed by the cephalosporins and tetracyclines, are most frequently implicated in these reactions. Azithromycin has shown enhanced pharmacokinetics in encountering the anaerobes involved in endodontic infection. The oral dosage of azithromycin is 500 mg loading dose followed by 250 mg once a day for five to seven days(Excellence, 2002).

Metronidazole is a synthetic antimicrobial agent, which is bactericidal and most effective against anaerobes. Baumgartner has shown effective number of bacteria resistant to metronidazole(Baumgartnar JC, Hutter JW, 2006).

The recommended dosage is 1000 mg loading dose followed by500 mg every six hours for five to seven days. Clindamycin remains the second drug of choice next to penicillin in treating odontogenic infections. However, b lactum antibiotics still remain the drug of choice in odontogenic infections among the health professionals(Gonzalez-Martinez R, *et,al* 2011).

2.3.2 Non-odontogenic infections

The non-odontogenic infections require a prolonged treatment. They include infections such as tuberculosis, syphilis, leprosy and non-specific infections of bone new synthetic antibiotics such as fluoroquinolones are the drug of choice for management of non-odontogenic infections. Fluoroquinones are indicated for bone and joint infections,

genitourinary tract infections, and respiratory tract infections (Bysted H, *et,al.*, 1978). They have a broad spectrum of action and inhibit bacterial DNA replication.
(Bysted H, *et,al.*, 1978)demonstrated high clindamycin concentration in human mandibular bone corresponding to doxycycline.

(Frei s, Labreche , 2011) stated that bone and anaerobic infections are managed by prescribing clindamycin (orally) or lincomycin (parenterally). Tuberculosis management requires a long duration of antibiotic service which includes ethambutol, isoniazid, rifampicin, pyrazinamide and streptomycin. Penicillin G benzatine is administered in the management of syphilis .Clofazimine; dapsone and rifampicin are used for treating leprosy.

2.3.3 Prophylaxis to prevent infective endocarditis

Infective endocarditic is an uncommon but serious and often life threatening condition. The pathogenesis of infective endocarditic comprises of a complex sequence of events (Gopalakrishnan , Shukla , 2009). Anatomic localization of infection is determined by the adherence of microorganisms to various sites (Wilson, 2007).

Antibiotic prophylaxis not only acts by destroying bacteria, but also by inhibiting bacterial adherence. It is indicated in high risk dental procedures in patients with pre-existing high rate cardiac disorders(Vera, 2007).

The standard regimen includes high doses of amoxicillin in children and adults, one hour before the dental treatment. 2 g of oral amoxicillin should be given to adults before the dental procedure commencement. Dajani et al have reported that 2g of amoxicillin provides several hours of antibiotic coverage. Clindamycin is recommended in patients allergic to beta- lactamics (Durack DT. *et,al.*, 2006).

2.3.4 Prophylaxis to treat local infections

There are various surgical procedures and medical conditions that are routinely covered by systemic antimicrobials which include impacted third molars, orthographic surgery,

implant surgery, peri apical surgery, benign tumor surgery and immunocompromised patients. The service of antibiotics in endodontic should be indicated for patients with signs of local infection and fever. Evidence shows prescribing antibiotics after removal of impacted third molars reduce the severity of postoperative pain(Piecuch , Arzadon , 1995).

Abu-Taa et al compared the benefits of pre- and post-operative antibiotics in patients undergoing periodontal surgery. Pertaining to the post operative antibiotics, remarkable reduction in the post operative discomfort was noticed(Abu-Ta'aM, *et,al*, 2008).Amoxicillin 2 000 mg for five days at a suitable dose and interval helps to cover the treatment requirements after third molar surgery. Studies show a decrease in postoperative infection, following the use of antibiotics after orthognathic surgery(Martinez Lacasa , Jimence , 2000).

Danda et al evaluated the prophylactic value of single-dose antibiotic prophylaxis on postoperative infection in patients undergoing orthognathic surgery, compared to single-day antibiotics. The documented results were clinically significant(Danda AK, et,al., 2010).

Paluzzi et al have emphasized the need of antibiotic prophylaxis for implant surgery. Studies reveal that 2 g of amoxicillin given orally 1 hour preoperatively significantly reduce failures of dental implants(Esposito M. *et al*. 2010).end osseous implants placed under antibiotic coverage and reported efficient reduction in post operative infections (Rizzo S, *et,al*., 2010).

Abu-Taa et al compared the benefit of pre- and post operative antibiotics in patients undergoing periodontal surgery. pertaining to the post operative antibiotics, remarkable reduction in the post operative discomfort was noticed (Abu-Ta'aM, *et,al*, 2008).

CHAPTER THREE:

3.0 METHODSAND MATERIALS

3.1 Study Area

The study was carried out in the dental clinic of KIU-Teaching hospital found in Ishaka-Bushenyi district. The clinic comprised of staff including dentists, dental intern doctors, nurse. .Ishaka is the largest town in Bushenyi district and it is located 75km by road, northwest of Mbarara, the largest city in the sub region. Ishaka Bushenyi municipality. The dominant tribe being Banyankole and others like Bakonjo, Batooro and Bakiga.

3.2 Study design

A cross sectional descriptive study was conducted, with involvement of quantitative methods of data analysis.

3.3 Study Population

The study population were all patients and health workers at dental clinic in KIUTH.

The target population were the dental health workers and some patients who attend at dental clinic or admitted due to dental related conditions.

3.4 Sample size determination

A sample size of the study was determined by the formula cited by fisher *et al*.

n= desired sample size

$n = z^2pq/d2$

z = standard normal deviation usually set at 1.96

p = the proportion of study population that receive health services at KIUTH (95%) (*Okeke, I. N. et al. 2006*)

q = 1 – p

d = amount of error (0.05 level)

p=0.95, q=0.05, d=0.05

$n=(1.96)^2(0.95)\ (0.05)/(0.05)^2$

n=72 respondents

3.5 Selection criteria for the study.

3.5.1 Inclusion Criteria

Dental staffs on duty by that time were asked.

Patients who were attending for dental services and were initiated on antibiotic therapy.

Post-operative files were considered.

3.5.2 Exclusion criteria

Patients who were not initiated on antibiotic therapy

3.6 Quality control.

The study instruments were pre-code and pre-test questionnaires, Interview tool guide and observational tool guide. Research Assistant was employed and trained by the researcher to collect data. The researcher code, all the participants and no names was needed during the study, Data that was collected from the study unit was recorded on the document by the researcher.

The questionnaires consisted of a close ended (Yes or No) and open ended questions. The researcher collected data by observation, interview of the selected participants and recording responses in the questionnaires, and the researcher checked for completeness of the questionnaires.

3.7 Sampling method for the study.

The sampling was done at KIU-TH, employing simple random sampling; informed consent was sought from the patient and health workers at the dental clinic. Thereafter two lots containing yes and no for prospective participants to choose was made in order to determine who was to participate in the study; those patients that choose yes in the lot were subsequently recruited into the study.

3.8 Data analysis

The data was collected , sorted , tallied and presented inform of tables and figure to describe the magnitude of the assessment. The results were discussed in consistence with research questions and literature review.

3.9 Reliability and validity

The following were employed,

there was use of pre-tested questionnaires, interview tool kit and observational guide.

Data collectors were trained.

Used language/terms that were easily understood by participants.

The principal investigator supervised other researchers/data collectors.

Only participants who were interested and able to give necessary information were allowed to participate in the study.

3.10 Ethical considerations

The researcher had to do the following.

Use of an introductory later from KIU research committee.

Obtaining an authorization letter from KIUTH administration and dental clinic in charge to carry out the study.

Obtaining participants informed consent to participate in the study.

Observing confidentiality of data collected and the data was strictly used for the purpose of this research.

No names or personal identity was used on the data collection tool.

3.11 Limitations

The anticipated limitations was overcome as shown below.

Time constraints – was addressed by taking a manageable sample size as well as recruiting data collectors.

Language barriers – data collectors who speak both English and Runyankole were employed.

Financial and logistic limitation – was addressed by taking a small from well-wishers and sectors which may benefit from the results of the study.

CHAPTER FOUR

.4.0 RESULTS PRESENTATION AND INTERPRETATION

This chapter presents the Results, Analysis and interpretations of findings of the study according to the specific study objectives. Findings and results are presented in form of tables and figures.

4.1 Social demographic characteristics of study population

From the study conducted, the following results were obtained from a sample of 72 patients who were attending at dental clinic with dental cases at KIU-TH Ishaka Bushenyi

A total of 72 patients who attended dental clinic at KIU-TH participated in the study in the month of April 2017. A greater proportion 32 (44.44%) of the patients who participated in the study were young adults in the interquartile range of 21-30. More females 50(69.44%) participated in the study and a high proportion 30(41.67%) attained education up to primary level.

Table 1: Social demographic characteristics of study population

VARIABLE	FREQUENCY	PERCENTAGE
Age n (%)		
Below 10	5	6.94
11-20	10	13.89
21-30	32	44.44
31-40	15	20.83
41 and above	10	13.89
Total	**72**	**100**

Sex n (%)		
Male	22	30.56
Female	50	69.44
Total	72	100
Educational level n (%)		
Primary	30	41.67
Secondary	24	33.33
Others	18	25.00
Total	**72**	**100**

4.2 Some of the signs and symptoms of dental cases.

The study findings of some symptoms and signs that respondents shown with at the dental clinic due to infections with toothache at 31(43.05%), painful chewing at 22(30.55%), fever 3(4.16%), tender swollen gums 6(8.33%) and others at 10(13.88%) all out of 72 respondents.

Table 2: The symptoms and signs presented by patients who come with dental cases.

VARIABLE	FREQUENCY	PERCENTAGE
Symptoms		
Toothache	31	43.05
Painful chewing	22	30.55
Fever	3	4.16
Swollen gums	6	8.33
Others	10	13.88
Total	72	100

4.3: Some of the antibiotics used in dental cases.

Out of the 72 respondents, the study shows amoxicillin at 33(45.0%), metronidazole at 19(26.4%), clindamycin 9(12.5%) and others 11(15.27%) in dental clinic

Table 3: Some of the antibiotics used and prescribed to patients in dental clinic

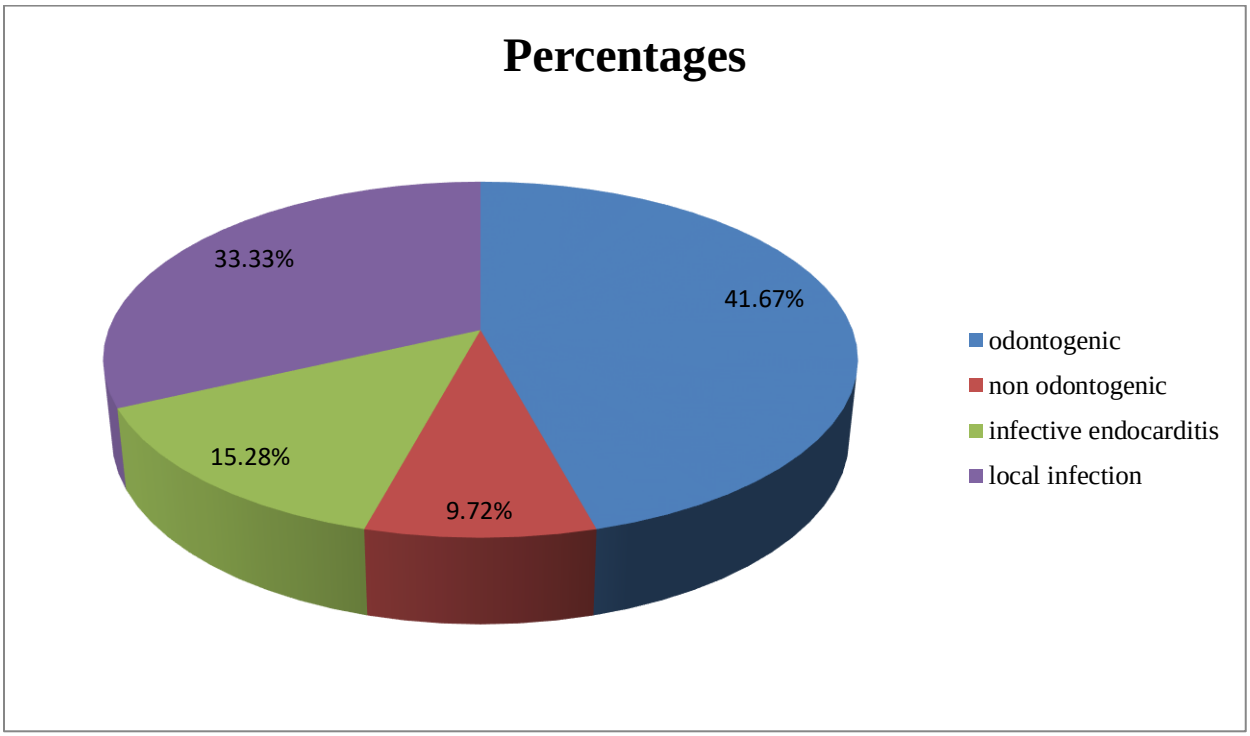
VARIABLE	FREQUENCY	PERCENTAGE
Antibiotics n (%)		
Clindamycin	9	12.5
Amoxicillin	33	45.83
Metronidazole	19	26.4
Others	11	15.27
Total	**72**	**100**

4.4 Indications of Antibiotics in Dental Clinic

Part1: Table a; the table below shows some of the indications of the antibiotics in dental clinic at KIU-TH. The results got on the indications of some antibiotics in dental clinic with odontogenic infections at 30(41.67%), non odontogenic infections at 7(9.72%), prophylaxis of infective endocarditis at 11(15.28%), prophylaxis of local infections at 24(33.33%) out of the 72 respondents of the study each.

Indications		**Drugs**	**Frequency**	**Percentages**
Odontogenic infections	Periodontal abscess, Dental caries, NUG	Amoxicillin, Clindamycin	30	41.67%
Non odontogenic	Tuberculosis, bone marrow infections, Syphilis	Rifampicin, ciproflaxin, Clindamycin.	7	9.72%
Prophylaxis for infective endocarditis		clindamycin, amoxicillin. vancomycin	11	15.28%
Prophylaxis of local infections	Immunosuppression, Surgeries, begnin tumors surgery, tooth extractions	Amoxicillin Clindamycin	24	33.33%
Total			72	100

Part 2: Figure bs; the pie chart below shows the various indications of antibiotic use in dental clinic at KIU-TH



The pie chart above represents the study findings of the indications of antibiotics in dental cases in dental clinic at KIU-TH. They show odontogenic infections at 41.67%, non odontogenic infections at 9.72%, prophylaxis of infective endocarditis 15.28%, and prophylaxis of local infections at 33.33%.

CHAPTER FIVE

DISCUSSION, CONCLUSION, RECOMMENDATION

5.0 Introduction

This chapter presents the summery of the findings, discussions, conclusion and recommendations of the study findings that were presented in the previous chapter

5.1.1 Symptoms Presented by Dental Patients

According to the results obtained, the different symptoms associated with dental cases according to the respondents where most presented with toothache at 43.05% where sensations are generally sharp, lasting as long as the stimulus and a spectrum from physiologic sensation to pain in disease (Napeñas , 2013). In a toothache, nerves are stimulated by either exogenous sources or endogenous factors (Hargreaves , *et al.* 2011).

Also according to the result above in the table 2, fever at 4.16% is mostly brought up due to the inflammatory mediatory ("Medical Subject Headings"2013).

The study also views painful chewing at 30.55% where an unpleasant sensation caused by intense or damaging events in experienced when chewing food which can also be accompanied by dysphagia also as cited above in the literature (Hargreaves KM, et al. 2011).

The study also identifies tender swollen gums at 8.33% with other symptoms at 13.88% which are associated with the above symptoms which include tender, swollen lymph nodes under your jaw or in your neck, sudden rush of foul-smelling and foul-tasting, salty fluid in your mouth and pain relief if the abscess ruptures, bad breath that won't go away, red or swollen gums, tender or bleeding gums(Figini L, et al. 2007).

5.1.2 Common Antibiotics Used in Dental Clinic

According to the of use of antibiotics, the study findings on common antibiotics found being mostly prescribed in the treatment of dental cases are amoxicillin at 45.83%followed by metronidazole at 26.4%, clindamycin at 12.5% and others at 15.27%

which further more describes the overuse of antibiotics in treatment of most dental infections as described in the literature that most infections of dental origin still respond to penicillin group of antibiotics **(**Brescó-Salinas M, *et al*. 2006).Amoxicillin (45.83%) is the most used because of the cidal effect and being a broad spectrum antibiotic given that antibiotic which cidal effects do more activity than the static drugs in treatment of dental infections as cited that bactericidal antibiotics are preferred when the host is immune compromised as bacteriostatic drugs require the host's immune system to completely eradicate the infection **(**Mani N, *et al.* 2006).

It's also shown by the study that clindamycin (12.5%)is useful in penicillin allergic patients and has a wide spectrum of activity including anaerobes and also given that it being a second choice drug from penicillin's in the treatment of some dental infections **(**Núñez, *et, al.*, 2009).

Metronidazole at 26.4% is also involved in the study where it's more preferred in the combination therapy treatment with penicillin especially in treatment of odontogenic infections and more useful in abscess formation like periodontal abscesses **(**Daramola OO, et al. 2009).

Other at 15.27%, antibiotics such as Vancomycin, streptomycin,gentamycin,ampicillin are also useful but prescribed in prophylactic incidences like infective endocarditis, macrolides such as azithromycin which are used in treatment of patients allergic to penicillin's from the second choice of clindamycin in penicillin allergy (Sequra-Eqea , *et, al.*, 2010).

5.1.3 Indications of Antibiotics in Dental Clinic

According to the results in the table and pie chart obtained showing some indications of antibiotics in treatment of dental cases with 72 respondents, the study identifies odontogenic infections at 41.67% which involves infections such as periodontal abscess, dental caries, alveolar abscess and necrotizing ulcerative gingivitis which infections can be managed by antibiotics and here it penicillin's as the drugs of choice (Sequra-Eqea , *et, al.*, 2010).

Prophylaxis of local infections at 33.33% is said to be another indication of antibiotics in dental where they are used in after surgeries like tumor surgeries, tooth extractions to prevent sepsis on surgical sites especially as also cited when Abu-Taa et al compared the benefits of pre- and post-operative antibiotics in patients undergoing periodontal surgery. Pertaining to the post operative antibiotics, remarkable reduction in the post operative discomfort was noticed(Abu-Ta'aM, *et al*. 2008).

The results also show that prophylaxis of infective endocarditis at 15.28% which is an uncommon infection but antibiotic prophylaxis not only acts by destroying bacteria, but also by inhibiting bacterial adherence. It is indicated in high risk dental procedures in patients with pre-existing high rate cardiac disorders (Vera JRM, et al. 2007).

And also the results show non odontogenic infections at 9.72% as an indication out of the 72 respondents as cited that the non-odontogenic infections require a prolonged treatment. They include infections such as tuberculosis, syphilis and non-specific infections of bone new synthetic antibiotics such as fluoroquinolones are the drug of choice for management of non- odontogenic infections. Fluoroquinones are indicated for bone and joint infections, genitourinary tract infections, and respiratory tract infections(Bysted H, *et, al*., 1978).

5.2 Conclusion

The definitive assessment of antibiotics use, common antibiotics and symptoms presented by patients in dental clinic are limited and specific though they bring out the utilization of antibiotics with dental cases in dental clinic at KIU-TH. Some indications found in the study include odontogenic infections, non odontogenic infections, prophylaxis of infective endocarditis, prophylaxis of local infections where it also identifies common antibiotics used such as amoxicillin, metronidazole, clindamycin, macrolides, among them and also the symptoms such as painful chewing, fever, toothache and swollen gums which are tender. Appropriate antibiotic and prescription of antibiotics by dentists is urgently needed in view of the antibiotic resistance strains and occurrence of a biofilm of organisms in the oral cavity while combination therapy also works. Dental Infections, should first receive the appropriate local therapy with prevention which can sometimes be complemented with a systemic treatment with

antibiotics. There are no literature to provide information on antibiotic use in dental origin infections at all levels.

5.3 Recommendations

Therefore under the treatment regimes with use of antibiotics in dental clinic at KIU-TH, I would recommend that;

There should be more sensitization about antibiotic resistance in some indicated infections ministry of health.

The dentists should follow the proper prescription table to avoid resistance hence encouraging proper use of antibiotics.

sensitization of patients about oral care to prevent occurrence of infection should be advised to patients

Also doing sampling severe conditions like dental abscess before prescription of antibiotics and also proper identification of symptoms clinically before antibiotic use.

Further studies to assess the antibiotic use should be done over a wide geographical area.

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APPENDIX I: QUESTIONNAIRE

Introduction

You are welcome to KIU-TH Dental clinic, I am a student from KIU, I am **Bagalana George**, doing diploma in clinical and community health, I am carrying out an assessment to find out the Utilization of antibiotics with dental cases in dental clinic at KIU-TH, I would wish that you participate in this study since I can only get a feedback about the services provided from you the user, If you agree then Tick Yes …….. No (if you don't agree)……

Thanks for accepting to participate in this study which is aimed towards finding out the quality of care and services you are receiving from the dental clinic of KIUTH, the information you give us shall not be used for any purpose other than improving the service at this important clinic. Feel free to express your opinion and any information given to me shall be treated with grate confidentiality and not by any means shall it affect your attendance at this clinic.

PATIENTS ATTENDING DENTAL CLINIC

1. Age?

   ……

2. Sex?

   Male……..(y) or (n)

   Female……(y) or (n)

3. Education level?

   Primary……..

   Secondary…….

   Others (specify)…….

4. Is it your first time experiencing any tooth problem?

   ……

5. For how long did the problem last and at what age?

   …….

6. Did you get any treatment for the problem you got?

   Yes……..

   No…….

7. If yes, do you recall the medications that were given to you for the tooth problem and what were they?

   …….

8. What was the treatment outcome after treatment?

   …….

9. What symptoms or how did you feel when you got the problem of the tooth?

   Fever……

   Toothache……

   Painful chewing……

   Swollen gum……

   Others (specify)…….

10. Did you under go any tooth extraction or oral surgery when treating the tooth or?

    Yes…….

    No…….

11. Is there any history of a heart disease in your family or you experiencing any heart disease?

    Yes…….

    No……..

HEALTH PROFESSIONALS IN DENTAL CLINIC

12. What are the common symptoms patients present with to consider antibiotic prescription in dental clinic?

    …….

    …….

    …….

13. What are some of the common antibiotics used in dental clinic in treatment of cases?

    ……..

    ……..

    ……..

    ……..

14. What is considered before administering any antibiotic in dental clinic?

    …….

15. What antibiotics are mostly responded to by dental infections? (Tick where applicable)

Antibiotic	Tick
Metronidazole	
Amoxicillin	
Clavulin(Amoxicillin + Clavulinic acid)	
Clindamycin	
Others (specify)……	

16. What class of antibiotics is most favorable for treatment of dental cases as in the prescriptions?

    ……

17. With bactericidal and bacteriostatic antibiotics, what do you consider most?

    ……..

18. How long do you administer antibiotics when given to patients (duration)?

    .....…….

19. When are antibiotics indicated in treatment involvement?

.....

20. What are the major etiological factors considered in dental treatment cases?

Odontogenic infections…….

Non odontogenic infections…….

Prophylaxis of infective endocarditis…….

21. Is there any need for follow up in treatment of dental cases with antibiotic therapy?

    Yes……

    No…….

Thank you for Participating in this study May the Good Lord Bless you

APPENDIX III: MAP OF BUSHENYI

APPENDIX IV: MAP OF UGANDA