DETERMINANTS FOR LATE PRESENTATION OF HEAD AND NECK CANCER AT KENYATTA NATIONAL HOSPITAL.

DISSERTATION SUBMITTED IN PART FULFILLMENT OF THE AWARD OF DEGREE OF MASTERS IN MEDICINE IN ENT, HEAD AND NECK SURGERY AT THE UNIVERSITY OF NAIROBI.

INVESTIGATOR: DR J. N. MUIRU. (M.B. Ch. B.)

SUPERVISOR: H. O. OBURRA. (M.B. Ch. B, M.MED. FRCS)
ASSOCIATE PROFFESOR AND
CHAIRMAN,
DEPARTMENT OF SURGERY
UNIVERSITY OF NAIROBI.

DATE: JUNE 2006

DECLARATION

PRINCIPAL INVESTIGATOR

Dr. J. N. Muiru M.B. Ch. B.

I certify that this is my original work and that it has not been presented for approval in any university.

Signature.....

Date.....13/11/06.....

SUPERVISOR

H.O. OBURRA. M.B. Ch. B., M.MED., FRCS

Associate professor ENT/ Head and Neck surgery and chairman, department of surgery, University of Nairobi.

This dissertation has been submitted for examination with my approval as a University lecturer.

Signature.....

Date.....13/11/06.....

DEDICATION

This work is dedicated to my wife Carol Ndungu for her continuous encouragement throughout the course and bearing the blunt of my absence in bringing up the children.

To my children Grace Wambui and Onesmus Muiru, a great gift and blessing from God who always put a sense of purpose in my life.

To my parents Grace Muiru and the late Onesphoro Muiru who despite their background discovered the value of good education and made sure I got it.

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EVIATIONS

ENT	-	Ear, nose and throat
ENT/HN	-	Ear, nose throat / head and neck
HNC	-	Head and neck cancer
HNSCC	-	Head and neck squamous cell cancer
KNH	-	Kenyatta National Hospital
LC	-	Larygngeal Cancer
LOH	-	Lose of Heterozygosity
NPC	-	Nasopgharyngeal cancer
PHCP	-	Primary Health Care Provider
PHF	-	Primary health facility
RB	-	Rhabdomyosarcoma gene
TSG	-	Tumor suppressor gene
UADT	-	Upper aerodigestive tract
PDI	-	Presentation to diagnosis interval
OpSCC	-	Oropharygeal Squeamous Cell Carcinoma
KENTS	-	Kenya Ear Nose and Throat Society
KEMRI	-	Kenya Medical Research Institute
PCR	-	Polymerase chain reaction
OPhC	-	Oropharyngeal cancer
HyPC	-	Hypopharyngeal cancer
OcC	-	Oral cavity cancer
SNC	-	Sinonasal cancer
SGC	-	Salivary gland cancer

NTENTS

ABSTRRACT

ad and Neck Cancer patients frequently present late and occupy about 50% of inpatients bed
ce in the Ear, Nose, Throat, Head and Neck surgery Department of the Kenyatta National
spital. This study aimed to describe the determinants of late presentation of Head and neck
ncer at Kenyatta National Hospital. It was descriptive cross sectional hospital based study
ried out at the Kenyatta National Hospital Ear, Nose and Throat/Head and Neck Surgery
partment, Radiotherapy Department and other departments managing Head and Neck Cancer.
tients presenting for the first time at Kenyatta National Hospital Ear, Nose and Throat/Head
d Neck department and other departments managing head and neck cancer and meeting the
escribed inclusion criteria were interviewed, examined and their records scrutinized for
ecified demographic and clinical data, which were extracted and entered into a questionnaire.
ne results were analyzed using SPSS and presented in graphic tables.

ne hundred and seventy four patients being managed for Head and Neck Cancer (HNC)
Kenyatta National hospital were inducted. The primary sites were larynx (LC) 64
6.8%), Nasopharynx (NPC) 45 (25.9%), Hypopharynx (HyPC) 10(5.7%), oropharynx
OPhC) 15 (8.6%), oral cavity (OcC) 9 (5.2%) sinonasal (SNC) 14(8%), Salivary glands
SGC) 11(6.3%) and others 6 (3.4 %). The later group included a small number with
habdomyosarcoma, malignant melanoma, Kaposi sarcoma and occult primary.
Over 87% of the patients had squamous cell carcinoma.

Overall 152 (87.3%) patients had stage III & IV disease and 22 (12.6%) had stage I and
I. The mean duration of symptoms for all primary sites at diagnosis was 57.23 weeks
Range 4 – 521). Patient delay accounted for 35.29 weeks, presentation at PHF to referral
or specialized management 13.76 weeks and professional diagnostic delay at KNH 7.97
veeks.

e majority of the patients came from Central and Eastern provinces of Kenya 39.9%
d 25.4% respectively accounting for 65.3% of total.

ajority of our patients are poor or living below poverty line (80.6%). The level of
ucation for majority was also low with 73.4% having only up to primary level. The
ntrol group in this study (patients will stage 1 & II diseased) was quite small and also
ost of the patients in the sample had almost similar parameters being tested as
terminants of late presentation. The results of this study unfortunately suggest that the
otential for increasing the proportion of patients being diagnosed with early disease is
ry limited as no statistical relationship was established between duration of symptoms,
cioeconomic status, education level, distance and cost to health facilities and stage at
agnosis.

INTRODUCTION.

It is now generally accepted that most malignant neoplasm's result from multi-step process of accumulated genetic alterations that result in clonal outgrowth of transformed cells. The genetic alterations occur over a period of time. Exposure to carcinogens is believed to be the predominant cause of specific genetic alterations that result in Head and Neck Cancer (HNC) progression (1). Despite this knowledge early detection and presentation of HNC is still an elusive venture. Detection and treatment of early disease generally gives good results with outcomes in some sites approaching 90 % (2) while late disease gives dismal outcomes. Knowledge of factors that cause the disease to present late and poor outcomes of treatment will greatly help in early detection and management planning for patients with HNC.

Late presentation of cancer of the nasopharynx and larynx is well demonstrated in a recent local study (3). In this study administrative delays from onset of symptom to diagnosis are well documented with average waiting time of 5-6 months.

In the Ear Nose and throat- Head and Neck (ENT-HN) surgical unit of Kenyatta National Hospital (KNH), head and neck oncology patients occupy over 50% of the inpatient beds (3). The late presentation of HNC is partly responsible for this high bed occupancy rate because advanced disease needs combination treatment which includes radical surgery, radiotherapy and chemotherapy.

Late presentation of HNC is a universal problem (4). There has been little improvement in crude survival rates of HNC patients over the last two decades hence the need to identify factors associated with its late presentation. Since treatment and survival outcomes for HNC are dependent on host, tumour and treatment factors (5.) Oncologists

therefore have no option but to try to manipulate host and tumour factors in order to improve survival for HNC patients.

TNM staging remains one of the major prognostic indicators for HNC that can accurately be reproduced. Stage 1 and 11 disease is considered early while state III and IV is considered late. This study sets out to describe the determinants for the late stage at presentation of HNC patients KNH. If it can be established that there is a correlation between duration of symptoms and stage at presentation and that there are avoidable causes of late presentation from onset of symptoms to establishment of a clinical diagnosis then a preventive educational program can be initiated in our health care system directed mainly to Primary Health Care Providers (PHCP), the high risk groups and the various KNH departments involved in diagnosis and management of HNC patients. Ultimately this will help in getting better treatment outcomes for our patients. In this regard, there is a parallel study currently going on at the ENT HN surgery Department of KNH to determine the stage of presentation and treatment outcomes of various HNC patients whose results shall serve as a reference point for this and other future studies.

EPIDEMIOLOGY.

Head and neck cancers are the sixth most common cancers world-wide (6). The incidence varies worldwide with a higher incidence reported in the developing world. Squamous cell carcinoma is the most common histological type accounting for over 80 per cent of HNC cases, if one excludes cancers of the thyroid, salivary glands and the nasopharynx (7).

Cancer of the head and neck appears to be induced by a combination of factors that include choice of lifestyle, occupational exposure, and exposure to ionizing radiation and susceptibility to sequelae of viral infection. The incidence rates of cancer of sites that are susceptible to alcohol and tobacco use have paralleled patterns of alcohol and tobacco consumption (8). The identification of risk factors and the institution of appropriate preventive measures are essential to lowering the incidence of these diseases.

The relative 5-year survival rates of HNC have continued to improve in the United States over the decades with the most marked improvement noted in cancer of the larynx (9).

In Kenya, data on cancer epidemiology is still hazy. The situation will however soon be clarified when the Kenya Medical Research Institute (KEMRI) led compilation of the National Cancer Registry is concluded in a few months. Nevertheless, preliminary hospital data suggests that most HNC patients originate from the Kenyan Highlands with low prevalence areas being the North Eastern and Western parts of Kenya. These high prevalence areas are also the areas likely to be favoured by the KNH area coverage. These trends will have to be authenticated by the National Cancer Registry.

CARCINOGENESIS

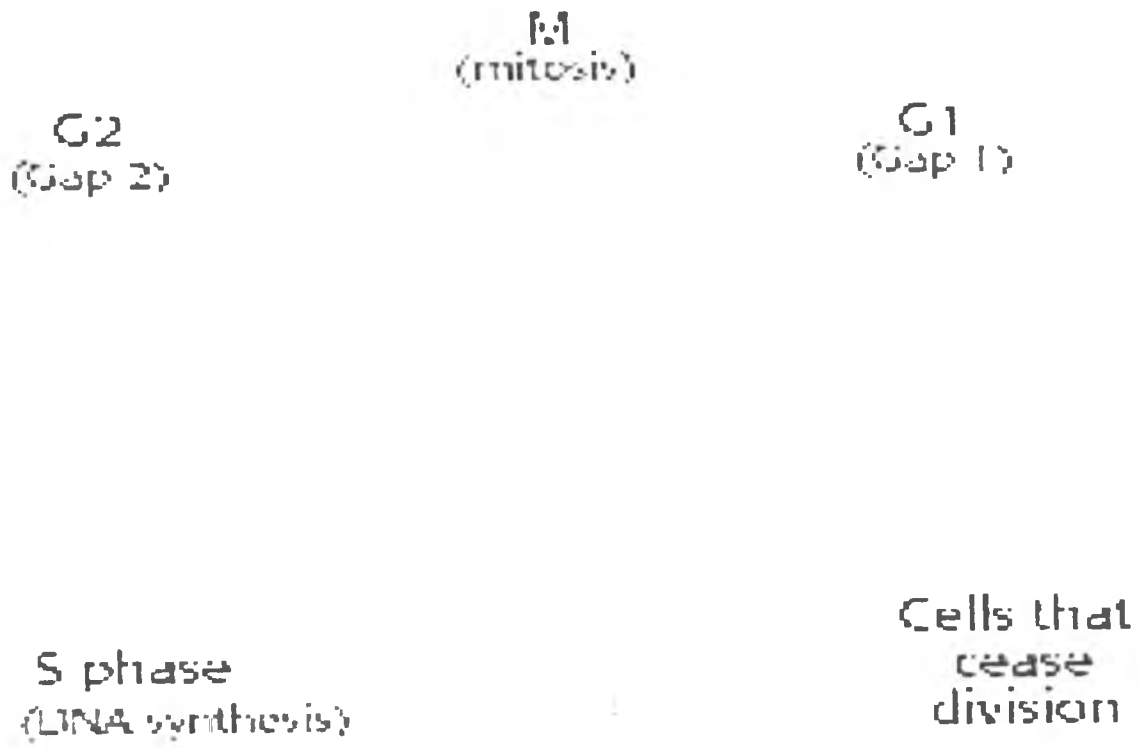
In order to understand the determinants of late HNC presentation, one has to appreciate an overview of HNC carcinogenesis. A lot of work has been done on carcinogenesis with carcinogens and epidemiological factors being clarified. Several risk factors for carcinogenesis have over the years been identified with some playing major roles and others minor ones. These risk factors include alcohol, tobacco, diet, wood dust, radiotherapy, radioisotopes, Human Papilloma Virus (HPV), and Ebstein Barr Virus (EBV) among others (10.11, 12, 13, 14, 15, 16, and 17). Carcinogens which are either termed as initiators or promoters cause a susceptible cell to undergo malignant transformation and develop into a malignant growth. They may also predispose a cell to malignant transformation. Carcinogens act by altering the genes that control cell cycle. Alternatively they may alter the genes in the vicinity of tumour suppressor genes and proto-oncogenes, or even the genes themselves thus changing their genetic expression. Some carcinogens act via alteration of genes that control genetic repair, hence allowing mutated cells to have a progeny with defective genetic repair system. All these events may set the cell into a path of uncontrolled proliferation and hence cancer.

At molecular level, the control mechanisms of cell proliferation and aberrations that decontrol this process are being unraveled. The mechanisms and role of apoptosis in the cell cycle control have also been noted. Tumour suppressor genes e.g. p53, p16, retinoblastoma genes as well as oncogenes, e.g. myc and ras and their precursor proto-oncogenes, have been defined and more are likely to be defined in the near future. Tumour suppressor genes and hence their protein products usually act on other proteins including cyclins which modulate cell cycle at G1 and G2 levels. Others like p53 may

have effects both at the above mentioned sites and the apoptotic arm of the cell proliferation control system.

Despite this detailed molecular information of carcinogenesis, there is no mechanism, of determining the exact moment when such genetic events occur in any individual at any time. This is complicated by the fact that carcinogenesis is a result of multiple accumulated mutagenesis. Although an approximately eight such mutations are required for cancer to occur, the events do not have a recognized set of sequence. It is therefore very difficult to time the onset of cancer and hence early diagnosis. One has thus to rely on the secondary effects of cancer, including appearance of a mass, pressure effects, pain or occlusion of a lumen. There are thus many factors including the patient's attitude to symptoms, clinical acumen of the clinician and the socioeconomic status that may determine the time of detection and eventual arrival of the patient to an otolaryngologist/head and neck surgeon.

The Cell Cycle.



Cell cycle. The various phases of the entire cell cycle are depicted. The cell cycle typically lasts 1 to 25 hours in animals. Only 1 hour is spent in the M phase. The longest and most variable phase is G1, which can range from 4 to 24 hours.(with the kind permission of Prof Oburra. UON)

MOLECULAR PROGRESSION MODEL FOR HEAD AND NECK CANCER.

This tries to identify the temporal relationships of genetic alterations in tumourigenesis and their relationship to histological progression of tumours.

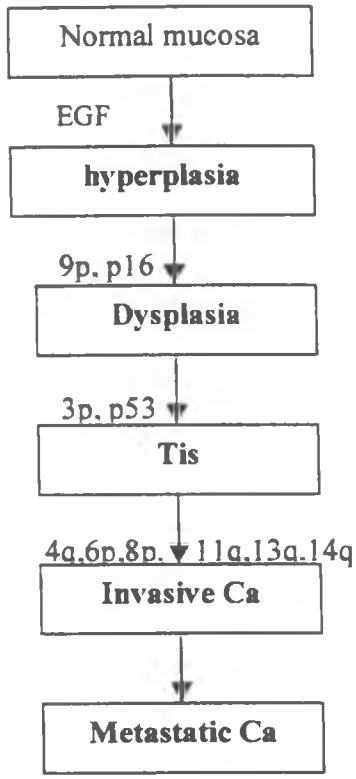


Figure 2: *Preliminary tumor progression model incorporating stages of clinical progression with molecular alterations. The exact sequence of events is likely to vary somewhat among tumors with similar clinical appearance. A great deal of detail remains to be discovered*

POSSIBLE FACTORS THAT MAY DETERMINE LATE PRESENTATION OF HEAD AND NECK CANCER

There are many factors that may determine the stage of the disease at presentation of head and neck cancer. Presented below are the likely factors that have yet to be proven.

Attitude and Practice of the patient.

The patient's attitude to the early symptoms may be a determinant on whether a patient would seek early medical attention or not. Patient's health seeking habits do not entirely depend on their level of education. Many patients tend to downplay the importance of early symptoms like hoarseness, oral ulcer, sore throat or epistaxis. Others, because of their belief in alternative medicine, may not seek medical advice even after referral by a competent primary health care worker. Some educated patients would linger around the denial stage trying to avoid the prospects of bad news.

Availability and Level of a Health Facility

Availability of a health facility at a manageable distance could play a determining role in the prospects of a patient seeking medical attention. If such a facility were available, its low level of staffing and low sophistication of the equipment may not allow a tentative diagnosis to be made. Like patients, many primary health workers tend to ignore and downplay the importance of early HNC symptoms unless they have had basic training in otolaryngologic disease.

Socioeconomic Status

There are situations where patients may be aware of the gravity of their symptoms and may have been referred to a tertiary health facility but are unable to afford such an undertaking. Considering the fact that over 52.6% of Kenyans live below the poverty line (18) and that most of the country is not endowed with the bare minimum infrastructure like roads, health centers and water, many Kenyans would prefer to spend their time on survival pursuits rather than engage in unaffordable journeys.

Site of Cancer

Cancers located on easily accessible and visible site like the oral cavity and cervicofacial skin would probably elicit earlier quest for medical attention than hidden areas like nasopharynx and larynx. Likewise, cancers located in wide luminal areas like hypopharynx would elicit minimal symptomatology until they get voluminous and advanced enough to produce obstructive symptoms, hence late presentation.

Biological Behaviour of Cancer

Very aggressive tumours like anaplastic carcinoma of the thyroid usually present late as a rule and are usually incurable at diagnosis. This is because of their very fast growth and their tendency to be confused with inflammatory lesions.

Despite all of the above variables, HNC in Kenya presents late. A recent paper suggests that over 90% of nasopharyngeal cancers present at Stage III and IV (19). It is usually assumed that all of the above factors determine the late presentation but no study has been done to show the correlation.

STAGING SYSTEMS OF HEAD AND NECK CANCERS.

In order to define the late or early presentation of HNC, one must be conversant with the most frequently used staging system. Over the years several staging systems have been used. Steinthal proposed the first scientific classification of tumours of the breast and introduced orderly reporting of malignant tumours. In the 1950's, the International Union Against Cancer (UICC) modified the tumour, node, and metastasis (TNM) system (20). The American Joint Committee for Cancer Staging (AJCC) as the American counterpart to UICC in 1959 came with its modification (21). This system has over the years evolved to include practically every human cancer.

Initially there were UICC and AJCC versions of staging but fortunately, over the years, the two principal staging classifications for HNC, those of the UICC and of the AJCC, have undergone a convergent evolution and are now identical for all intents and purposes. Staging is important as a guide to treatment planning, prognosis and for comparison of results between centers.

For details of currently used combined UICC and AJCC systems see ANNEX I

EARLY DETECTION OF THE HEAD AND NECK CANCER

INTRODUCTION

As mentioned earlier. HNC is curable if detected early. Although most HNCs produce early symptoms, the diagnosis continues to rely on patient presentation and physical examination with biopsy confirmation. Since most patients present late due to aforementioned factors, diagnosis is frequently made at late stage (5). Studies confirm that survival does correlate with stage making early diagnosis and treatment optimal for the disease (2).

A thorough, meticulous and thoughtful systematic examination of the head and neck need only take a few minutes and can detect these cancers at an early and curable stage. The ideal goal being to discover HNC early, before patients present with symptoms of pain. mass, bleeding, otalgia dysphagia or cervical metastases. Errors in diagnosis are most often ones of omission, and hence the importance of a systematic approach to the head and neck examination for cancer, cannot be overstated.

HISTORY.

As in many cancers, the symptoms and history will often lead the clinician to not only the presence of a cancer but also the likely site of the lesion. The clinician should review the social, familial and medical history. He should document any risk behaviours (e.g. tobacco and alcohol use), a history of head and neck radiotherapy, familial history of HNC and a personal history of cancer. Patients over 40 years of age should be considered at a higher risk for HNC.

PHYSICAL EXAMINATION.

Before proceeding to do the physical examination the doctor must establish a rapport with the patient, make the patient feel comfortable and develop trust, as some of the procedures are sensitive and uncomfortable. The patient should be in the correct position. The clinician should also be comfortable and confident and take all the precautions in head and neck examination. Suggested tools for the oral examination for HNC include adequate light source, laryngeal mirrors, gloves, tongue blades, gauze pads, anesthetic mucosal spray, flexible nasopharyngolaryngoscope, otoscope, and nasal speculum. However different environments of practice will dictate obvious differences in the equipment and manner in which the examination is conducted.

HEAD AND NECK EXAMINATION.

The physical examination will encompass inspection, palpation and visualization using head light, mirrors and fibreoptic endoscopes- both the rigid and flexible.

The doctor should develop a routine and systematic physical examination protocol, which should be followed all the time with special emphasis on the problem area. This ensures that nothing is missed or overlooked. The face, eyes, nose, ears, oral cavity, lips, buccal mucosa, floor mouth, hard and soft palate, oropharynx, posterior pharyngeal wall, base of tongue and the neck should all be carefully examined and any mucosal changes should be noted, (ulceration, pigmentation changes, masses).

The above initial assessment should be within reach and capabilities of a primary health facility (PHF) save for the endoscopic examination. As circumstances would dictate, this

is not possible in our PHF where the bulk of HNC patients in Kenya initially present with early symptoms.

SYSTEMIC EXAMINATION.

The examination should include evaluation of all the organ systems of the body. Special emphasis on the systems that may influence the management planning is made.

The emotional and mental status of the patient should be assessed during the physical examination. There is a lot of emotional involvement during treatment and follow-up.

If the treatment protocol most likely to be administered will affect the cosmetics, voice or hearing then it is imperative that pretreatment assessment is done. This is important in rehabilitation of the patient after treatment.

ENDOSCOPIC EXAMINATION.

The following works of further examination are only available in tertiary hospitals and few provincial hospitals in Kenya and hence out of reach to the majority of Kenyans.

With advances in fibreoptic technology it is now routine to supplement the classic head and neck examination with rigid or flexible endoscopy in the clinic settings giving access and visualization of the hidden areas.

Panendoscopy is usually done under general anaesthesia and includes direct rigid laryngoscopy, oesophagoscopy and bronchoscopy. It is indicated in patients having HNC of the UADT. This allows all exposed mucous membranes to be assessed with bronchoscopy being optional depending on positive history, symptoms or imaging findings. In one series 20% cases had synchronous or metachronous multiple primaries

were found. During the endoscopy the T staging of the tumour should be done and biopsies taken from all suspicious areas. Extent of tumour invasion and resectability (tumour mapping) should be done at this sitting when patient is under anaesthesia. It is also ideal to do the N staging while the patient is under anaesthesia. The relaxation induced by general anesthesia also allows satisfactory clinical examination especially in the abdomen, the skin and genitourinary area.

DIAGNOSTIC IMAGING.

A number of imaging modalities are available for diagnosis in head and neck malignancies and the modality one uses will depend on the site and extent of tumour.

CONVENTIONAL RADIOGRAPHY.

With advances in diagnostic imaging technology the use of conventional radiography in head and neck has been relegated to the periphery though it still has a role. Plain radiographs and ultrasound are readily available at district and sub distinct hospitals. However it's not clear if their easy availability is matched by optimal use in our set up.

Chest radiograph.

A posteroanterior view is routinely done on all patients with head and neck cancer to exclude metastasis to the lungs, which is one of the early sites of distant metastasis from the head and neck. There are also a percentage of patients who present with the second primary in the lungs.

ULTRASOUND.

Ultrasound is very sensitive in detecting lymph node enlargement of the neck region. Its sensitivity may exceed that CT in this region (22). It is also quite effective for tumours of the thyroid and the parathyroid. It has limitations for tumours in the parapharyngeal and the prevertebral spaces. It is a better modality for screening for tumour invasion of the common carotid artery or the internal jugular vein or extra- capsular spread of disease outside the lymph nodes. The only set back is its low specificity.

CT SCANNING

This supplements the clinical examination in determining the extent of the disease. It is one of the modifiers of staging with 20.2% of clinical tumour stage being altered mostly upstaging (22) and it is currently an absolutely indicated investigation in management of HNC in tertiary hospitals.

MRI

MRI is used to assess the extent of local and regional tumour spread, the depth of invasion, and the extent of lymphadenopathy. MRI is preferred for assessing the extent of soft tissue involvement and for providing a three-dimensional display of the tumor. CT is superior to MRI in detecting early bone invasion. MRI is however still very expensive, time consuming and unavailable in all Kenyan public hospitals which manage over 90% of HNC cases.

TOLUIDINE BLUE (VITAL STAINING)

This is useful for adjunct to clinical examination and biopsy (23). Toluidine blue has been recommended for use as a mouth wash or for direct application on suspicious lesions. Its value comes from its simplicity, low cost, noninvasiveness and accuracy. In addition, it can help to determine the most appropriate biopsy sites and it surgically delineate margins. Toluidine blue staining in oral cancer screening found that its sensitivity ranged from 93.5% to 97.8% and specificity from 73.3% to 92.9% (23). Unfortunately this simple technique is not available even in tertiary hospitals in Kenya.

CYTOLOGY

Under certain conditions, exfoliative cytology (cell scrapings) serves as an adjunct to clinical diagnosis, as it enables more extensive screening and provides microscopic material if there is a delay in or contraindication to biopsy. Smears are most helpful in differentiating inflammatory conditions, especially candidiasis, from dysplastic or neoplastic surface lesions. In addition, cytology may be helpful in detecting field change in oral cancer, especially if this method is used in conjunction with vital staining.

Fine needles aspiration biopsy (FNAB) of subsurface masses is also an accepted diagnostic test, one that had increased in popularity over the past few years. This technique is extremely useful in evaluating clinically suspicious changes involving salivary glands and lymph nodes. When used by a skilled clinician, fine needle aspiration can often be the best way to establish a definitive diagnosis of unexplained masses of the neck or salivary glands (24). The value of FNAB in the Kenyan setup has been demonstrated by Mwangi (25) in differentiating between the benign and malignant

lesions and it is currently used as a preliminary investigation in evaluating head and neck masses whose nature is unclear.

MOLECULAR BIOMARKERS.

Knowledge about various cell markers that reflect growth and suppressor protein presence or activity may prove to be of great value in predicting cell behaviour. Genetic evaluations may serve a similar purpose in the identification and treatment of tumors. Current research is exploring the genetics of biochemical processes that may affect the development over expression of proto-oncogenes c-myc, EGFR and cyclin D1, as well as loss of heterozygosity of specific chromosome. Cellular alteration of response to growth factor and Beta's (TGF-beta) growth suppressor effect on tumour cells may become important as well. Salivary soluble CD44 is a potential molecular maker for HNSCC (26).

However the practical use of known makers as screening tools and their prognostic significance are still being investigated. The high costs of immunohistochemical and PCR techniques abolish their use in Kenya for routine screening except for confirmation of difficult histological sections.

LITERATURE REVIEW.

Oburra in 1988 reported a series of (3) 56 patients presenting with NPC and laryngeal carcinoma between 1988 and 1992 at KNH. All 34 patients with NPC presented with stage III and IV disease (100%) while only 3 (9%) out of 22 patients with LC presented with stage I and II disease. 26 (76.4%) of patients with NPC and 16(72.7%) of patients with LC presented to the PHF in three months and under from onset of symptoms. The average interval between first medical attention at PHF and first KNH appointment was 8.7 months. The delay was noted to be significant.

Vernham (4) did a study in 127 patients with HNSCC over a 2 year period at Victoria infirmary, Glasgow UK. Overall 78(61%) patients presented with stage III and IV disease. Seventy one per cent had cancer of the oropharynx, 77%, 34%, had cancers of hypopharynx and larynx respectively. In this study no relationship was established between duration of symptoms and stage at presentation. Fifty three percent of patients with advanced disease had symptoms for less than 3 months at diagnosis and only 28% had symptoms for more than 3 months. Of those who had delayed for more than 3 months to present 85% had waited for more than 1 month before GP referral, 32% had waited longer than 1 month between GP referral and attendance at ENT clinic and 40% to had been subjected to a delay of more than 1 month between first ENT consultation and diagnosis.

Allison (27) in 1998 did a study on the relationship between patient and professional diagnostic delays and patient prognosis in a group of UADT cancer patients. The sample comprised 188 subjects. Multivariate analysis found that for those having a pharyngeal cancer, a professional delay more than 1 month and age more than or 65 years were predictive of late stage disease. The results of this study suggest that, among patients with an UADT cancer, professional delays more than 1 month are contributing to an increased risk for being diagnosed with late stage disease. This is the only study which showed professional delay as a determinant in late presentation.

In the study of Arozullah (28) in 2003, the impact of health literacy on racial differences in cancer stage at presentation was investigated. Preliminary analysis of the first 108 patients interviewed revealed that 34% had late stage cancer at presentation; 49% were Caucasian; 40% were African-American 46% had 8^{th} or lower grade literacy and 65% reported high social support. Late stage cancer was more likely among patients with higher social ($p<0.001$) and affectionate ($p<0.013$) support, and with lower emotional support ($p<0.001$) and trust of physicians ($p<0.037$). Classification tree analysis revealed a two-attribute model including overall social support and exercise habits, that correctly classified 78% of early stage and 72% of late stage cancer patients. Only 6% of patients with lower social support had late stage cancer versus 48% with higher social support ($p<0.001$). Among patients with higher social support, 28% with greater exercise habits had late stage cancer compared 62% who exercised less ($p<0.019$).

Spector et al (29) did a large retrospective study of patients with SCC of the larynx and hypopharynx. Eighty seven per cent of patients with pyriform sinus SCC were found to have stage III or stage IV disease, 82% of patients with SCC of the posterior pharyngeal wall were found to have stage III or stage IV disease. As many as 17% of hypopharyngeal SCCs may be associated with distant metastases when clinically diagnosed. This is quite different from the rate of distant metastasis detected at autopsy, which has been reported to be as much as 60%. A relatively high incidence of delayed regional (i.e., 2 or more years after completion of primary therapy) and distant metastatic disease in hypopharyngeal SCC is related to the advanced stage of the disease at diagnosis. Almost 33% of pyriform sinus tumors may be associated with delayed regional metastases.

André et al (30) in 2002 did a study on the predictive factors for diagnosis of advanced-stage squamous cell carcinoma of the head and neck. They found patients with laryngeal and hypopharyngeal cancers were more likely to be diagnosed as having advanced disease than those with lip, oral, and oropharyngeal cancers (88.0% vs. 74.6%) ($P<.001$). Patient delay was inversely associated with clinical stage at diagnosis in patients with the same cancers, while professional delay was directly associated with a higher risk of advanced clinical stage at diagnosis ($P = .001$ and $P = .006$, respectively). In the analysis of laryngeal and hypopharyngeal cancer, both patient and professional delays were associated with advanced disease, with patient delay being a stronger predictive factor than professional delay.

They concluded that the clinical stage at diagnosis was associated with sociodemographic characteristics, patient delay, and professional delay.

Ortega et al (31) did a study on the Racial Differences in Head and Neck Cancer Stage, Treatment, and Vital Status. The sample included 806 non-Hispanic white males (whites) and 70 non-Hispanic black males (blacks) drawn from the Shands Hospital Tumor Registry (Gainesville, FL) during the years of 1995-2001.

They found that in the majority of cases (64%) the cancer had spread to the regional lymph nodes by the time of diagnosis. A greater percentage of blacks (27%) than whites (14%) presented with metastasis to distant sites. Of those cases that presented in the regional stage, 60% whites were alive compared to 29% of blacks ($\square^2$=14.733, df=1, p<.001). When controlling for the regional stage of tumor presentation, treatment did not differ between whites and blacks (p>.1). At the regional stage, the predominant form of treatment was radiation; however, 58% of whites were alive, while only 15% of blacks were alive at the time of data analysis.

From this study they concluded that most whites and blacks presented with head and neck cancer at the regional stage. Blacks were more likely to present head and neck cancer at a later stage. When controlling for the regional stage, a significantly smaller percentage of blacks were alive. When controlling for radiation, the major form of treatment for both whites and blacks, blacks were less likely than whites to be alive.

Tang Ho et al (32) looked at the prognostic significance of presentation-to-diagnosis interval in patients with oropharyngeal carcinoma.

Forty percent of patients (35/87) had a PDI of 3 months or longer. Referred otalgia, active smoking status at the time of diagnosis, stage IV disease, and advanced T stage were associated with a poor prognosis. Prolonged PDI itself was not associated with a significant decrease in survival in univariate analysis (hazard ratio, 1.27; $P = .52$). Furthermore, no significant correlation was found between PDI and N stage, T stage, young age at presentation (<45 years), or tobacco use.

From this study they concluded that difficulty in making the diagnosis of OpSCC was evident by the high proportion of patients with PDI of 3 months or longer. The PDI did not appear to have an impact on survival. Referred otalgia, widely recognized as a strong indicator of invasive head and neck cancer, portends a poor prognosis.

Carrol et al (33) evaluated HNC demographics in Alabama, USA. Lack of access to care and socioeconomic factors were linked to advanced head and neck cancer in Alabama's Black Belt, so labeled because of its rich black soil and once thriving agricultural trade. Known for its massive poverty, lack of education (more than 40 percent of adults have not completed high school), and low number of primary care physicians and dentists the seventeen counties that make up this region were among the most affected by head and neck cancer in the state. It was found that the incidence rates for head and neck cancer in Alabama are highest in the Black Belt region of the state and the northern rural Appalachian counties. Referral rates for head and neck cancer from these regions are almost double those of other areas of the state. Patients from these counties were generally referred for treatment at a later stage of disease with massive involvement of

bone and extra-oral soft tissue and grim prognosis. The data also showed that the number of primary care physicians and dentists practicing in the Black Belt region are lower than other areas of the state.

Forty-four percent of African Americans presented with T4 primary disease compared to 28 percent of Caucasians. The ratio for T3 and T4 combined is 77 percent for African Americans versus 54 percent for Caucasians. These ratios did not reach statistical significance with the numbers available at that time.

The conclusion made from the study was that the incidence rates of head and neck cancer in Alabama were highest in the Black Belt and rural northern Appalachian regions of the state. The cause of these high rates was unknown, but the data suggested a link to socioeconomic factors such as income level and access to primary care.

STUDY JUSTIFICATION

It is generally assumed that socioeconomic status, attitude of patients, availability of health facility, site of tumor and biological behavior of HNC determine late presentation but no study has been done to demonstrate this. The studies reviewed above show late presentation of HNC but do not strive show the statistical significance on the various factors. Secondly, there is as yet no documented CAP study on late presentation of HNC. Currently the local data available for the stage at presentation of cancers of HNC is for NPC and LC. In the above study administrative delays of over 8 months was noted. This study was conducted 1988 and 1992.

In this study the stage at diagnosis for all cancers of the HNC was described. The role of patient, administrative and professional diagnostic delays in contributing to late stage diagnosis were also be elucidated. As noted before, early detection and treatment results give good outcomes. Delays greater than one month have been shown to contribute to an increased risk of late stage diagnosis. The results of this study will help health service providers to determine the interventional measures to be put in place to facilitate early diagnosis.

AIMS AND OBJECTIVES

BROAD OBJECTIVE

To identify the determinants for late presentation of head and neck carcinoma at Kenyatta National Hospital.

SPECIFIC OBJECTIVES.

1. To determine the duration of symptoms from onset to first consultation at the Primary Health Facility, to referral to Kenyatta National Hospital, then to first Kenyatta National Hospital consultation and to the establishment of a histological diagnosis of Head and Neck Cancer.
2. To determine the distance of patient residence to the Primary Health Facility and to Kenyatta National Hospital.
3. To determine the level of and establishment at the first Primary Health Facility visited.
4. To determine the mode and cost of transport from the patient residence to Kenyatta National Hospital.
5. To determine the socioeconomic status of patient or guardian using parameters outlined in the section on methodology. These have been used in the economic survey of 2005 by the Ministry of Planning and National Development.

STUDY METHODOLOGY

STUDY DESIGN.

This was a hospital based prospective cross-sectional study.

STUDY AREA.

Study subject were sourced from Kenyatta National Hospital ENT/HN department and other departments managing head and neck cancer patients.

STUDY POPULATION.

All patients with HNC confirmed by histology that were seen for the first time and managed at KNH during the study period formed the study population.

INCLUSION CRITERIA.

This included the following:-

1. All patients with head and neck cancer confirmed at histology being seen for the first time at KNH.
2. Duly signed informed consent form from the patient or guardian.

EXCLUSION CRITERIA

Patient manifesting the following characteristics were excluded from the study:-

1. Refusal or unwillingness to participate in the study (this will not jeopardize patient management).
2. History of having received any anti-cancer treatment prior to being seen at KNH.
3. Insufficient data

SAMPLING TECHNIQUE.

All patients with HNSCC receiving treatment at KNH who satisfied the inclusion criteria were recruited into this study.

SAMPLE SIZE.

The sample size for this study was estimated using the following sample size formula for a one-sample situation.(Fisher's)

$$n=\frac{(Z_1-\alpha)^2\ P(1-P)}{d^2}$$

Where,

n=minimum sample size

$(Z_1-\alpha)^2=1.645^2$ at 95% confidence level

P=estimated prevalence of patient with late presentation (80%) from other studies

d^2=margin of precision error (0.05)

Thus the minimum sample size was 174 patients.

METHODS

All patients with head and neck malignancies booked in the various outpatient clinics or admitted to the wards at KNH interviewed, examined and their medical records scrutinized.

Those who met the inclusion criteria were inducted into the study.

For each of the recruited patients the following was done.

1. CLINICAL METHODS. A complete medical history was obtained from the patient as per proforma outlined in Appendix II. This included the onset of symptoms, when the patient presented to the PHF, when the patient was referred to KNH, when the diagnosis was made and the distance and cost of getting to PHF and KNH. The patient's occupation, level of education, health seeking habits and level of income were enquired using source of income, type of housing and amenities available in the house (see annex II) .

Access to health facilities was documented. The level of first PHF visited and the establishment (staffing) was documented. The cost and mode of transport to KNH was also be documented.

Physical examinations finding were obtained by examination of the patient. A standard proforma will be used for endoscopic findings. The general condition of the patient with, site of the primary tumor, local regional metastases, signs of distant metastases and any significant co-morbidity were examined for and noted.

2. **CLINICAL STAGE** of the disease as per physical examination, endoscopy, and radiological investigations was noted and entered into the questionnaire.

3. **HISTOLOGICAL DIAGNOSIS** of the tumour was entered into the questionnaire as outlined in appendix 11.

DATA MANAGEMENT.

All data from this study was entered into questionnaires and from there into a computer database, cleaned and verified, and analyzed using SPSS (statistical package for social sciences), version 8.0 software. Point prevalence's were determined as percentages of the study population. Data was analyzed into means and ranges and will be presented in form of tables. Any associations determined was considered statistically significant at a P value less than or equal to 0.05.

STUDY DURATION

The study duration was six months.

ETHICAL CONSIDERATIONS

The following measures were undertaken to ensure that the study was conducted in an ethical manner:

(i) Study participants were inducted only on voluntary consent by self, parent or guardian.

(ii) No patient was penalized for declining to participate in the study.

(iii) There were no extra costs to patients participating in the study.

(iv) The study was done after approval by the Ethical committee of KNH

(v) The results of the study will be published and made available for use by members of the medical fraternity.

DIFFICULTIES ENCOUNTERED IN THE STUDY

A lot of data for this study was extracted via patient interview. Therefore most information obtained from interviewing the patient was subjective. For example, it was be difficult to establish all distances and all level of staffing at PHF. To partly alleviate this problem, relief maps were used and data had to be confirmed at Ministry of Health headquarters where feasible.

TNM staging was not standard practice in all KNH departments managing HNC. There were a number of patients who were excluded from the study as a result of this.

RESULTS

One hundred and seventy four patients being managed for Head and Neck Cancer (HNC) at Kenyatta National hospital were inducted.

A: Age

The age range was 12-90 years. Majority of the patient were over fifty years mainly 50-69 yrs age group. Overall mean age of patients is 51.89 years. Table 1 shows the age group distribution in years

Table 1: Age group in years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10-19	14	8.0	8.2	8.2
	20-29	10	5.7	5.9	14.1
	30-39	15	8.6	8.8	22.9
	40-49	18	10.3	10.6	33.5
	50-59	49	28.2	28.8	62.4
	60-69	41	23.6	24.1	86.5
	70 & over	23	13.2	13.5	100.0
	Total	170	97.7	100.0	
Missing	System	4	2.3		
Total		174	100.0		

B Sex

The sex distribution was 134 (77%) males and 40 (23%) females. The male to female ratio was 3.35:1.Table 2 shows the sex distribution.

Table 2: Sex distribution.

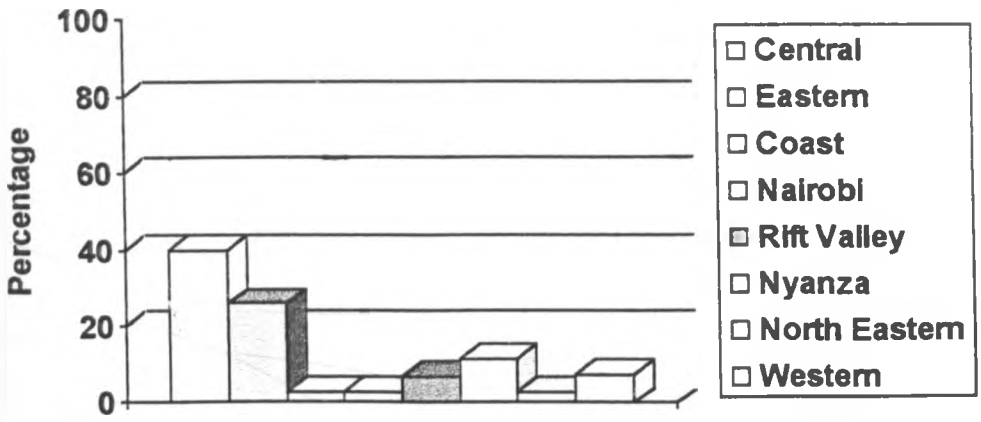
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	134	77.0	77.0	77.0
	female	40	23.0	23.0	100.0
	Total	174	100.0	100.0	

C Province of residence

Majority of the patients reside in the Central and Eastern provinces of Kenya accounting for 65.33% of the total. Table 3 shows the distribution of patients by province of residence.

Table3: province of residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Central	69	39.7	39.7	39.7
	Eastern	45	25.9	25.9	65.5
	Coast	5	2.9	2.9	68.4
	Nairobi	5	2.9	2.9	71.3
	Rift Valley	12	6.9	6.9	78.2
	Nyanza	20	11.5	11.5	89.7
	North Eastern	5	2.9	2.9	92.5
	Western	13	7.5	7.5	100.0
	Total	174	100.0	100.0	



D occupation

Majority of the patients were unemployed, subsistence farmers or petty traders accounting for 69.5 % of total. Table 4 shows the occupation of the patients.

Table 4: D occupation distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unemployed	42	24.1	24.1	24.1
	subsistence farmer	64	36.8	36.8	60.9
	petty trader	15	8.6	8.6	69.5
	farm labourer	1	.6	.6	70.1
	industrial labourer	2	1.1	1.1	71.3
	housewife	10	5.7	5.7	77.0
	casual labourer	3	1.7	1.7	78.7
	student	9	5.2	5.2	83.9
	servant	3	1.7	1.7	85.6
	artisan	4	2.3	2.3	87.9
	professional	13	7.5	7.5	95.4
	driver	8	4.6	4.6	100.0
	Total	174	100.0	100.0	

E education level

Over 70% of the patients either no formal education or up to primary level. Table 5 shows the level of education of the patients.

Table 5: education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	none	46	26.4	26.4	26.4
	primary	76	43.7	43.7	70.1
	technical training post primary	6	3.4	3.4	73.6
	secondary	32	18.4	18.4	92.0
	post secondary certificate	11	6.3	6.3	98.3
	university	3	1.7	1.7	100.0
	Total	174	100.0	100.0	

F housing

Most of the patients live in poor housing conditions. Table 6 shows the housing type and the distribution among patients in the study.

Table 6: housing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	temporary/makeshift	50	28.7	28.7	28.7
	semi-permanent	83	47.7	47.7	76.4
	permanent	41	23.6	23.6	100.0
	Total	174	100.0	100.0	

G Income

The vast majority of the patients in the study leave below poverty line 47.3% or are in the low income bracket 28.5% both accounting for 75.8% of all the patients reviewed. Table 7 shows the income levels of the patient.

Table 7: Income in Kshs per day

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 100 Kshs.	78	44.8	47.3	47.3
	100 - < 200	47	27.0	28.5	75.8
	200 & over	40	23.0	24.2	100.0
	Total	165	94.8	100.0	
Missing	System	9	5.2		
Total		174	100.0		

H Action taken when symptoms started

Upon developing of symptoms most patients did not take any action (75.3%) or they self medicated. Table 8 shows the actions taken when symptoms started.

Table 8: Action taken when symptoms started

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	waited	131	75.3	75.3	75.3
	self medication	21	12.1	12.1	87.4
	herbal remedies	2	1.1	1.1	88.5
	consulted PHF	11	6.3	6.3	94.8
	waited & self medication	9	5.2	5.2	100.0
	Total	174	100.0	100.0	

I: Reasons for not seeking medical advice

The reasons given for not seeking immediate medical attention were diverse but most patients assumed this was a minor illness. Table 9 shows the various reasons that were given.

Table 9: Reasons for not seeking medical advice

		Frequency	Percent	Valid Percent	Cumulative Percent
	minor illness	113	64.9	69.3	69.3
	self medication	8	4.6	4.9	74.2
	too expensive	2	1.1	1.2	75.5
	others	2	1.1	1.2	76.7
	went to traditional healer	1	.6	.6	77.3
	minor illness & self medication	31	17.8	19.0	96.3
	minor illness & too expensive	4	2.3	2.5	98.8
	minor illness, self medication, too expensive	2	1.1	1.2	100.0
	Total	163	93.7	100.0	
Missing	System	11	6.3		
Total		174	100.0		

J onset of symptoms to first medical consultation interval

The mean duration taken between onset of symptoms and first medical consultation at the PHF was 35.29 weeks. Table 10 shows the duration grouping, mean, median and range of duration.

Table 10: onset of symptoms to 1st consultation in weeks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Up to 11	55	34		34
	12-24	42	25.9		59.9
	Over 24	87	40.1		40.1
	Total	174	100		100
Mean				35.29	
Median				20	
range				0-520	

K type of Health facility visited for 1st consultation

Most of the patients were first seen at public health facilities mainly community health centres and dispensaries. Table 11 shows the type of facility attended.

Table 11: 1st Health facility medical consultation made.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	private	17	9.8	9.8	9.8
	public dispensary	28	16.1	16.1	25.9
	community health centre	53	30.5	30.5	56.3
	mission hospital/dispensary	20	11.5	11.5	67.8
	district/sub-district hospital	34	19.5	19.5	87.4
	provincial hospital	8	4.6	4.6	92.0
	pharmacy/chemist	2	1.1	1.1	93.1
	traditional/faith healer	1	.6	.6	93.7
	outreach programme	7	4.0	4.0	97.7
	KNH	3	1.7	1.7	99.4
	community health centre & KNH	1	.6	.6	100.0
	Total	174	100.0	100.0	

L cadre of medical personnel seen on 1st consultation

Most of the patients were first seen by a nurse or a clinical officer (66.1%) on their first visit to PHF. Table 12 shows the cadre of health personnel seen on first visit.

Table 12: Personnel seen at 1st consultation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	nurse assistant	1	.6	.6	.6
	nurse	23	13.2	13.2	13.8
	clinical officer	91	52.3	52.3	66.1
	medical officer	38	21.8	21.8	87.9
	ENT surgeon	18	10.3	10.3	98.3
	haematologist	1	.6	.6	98.9
	pharmacist	2	1.1	1.1	100.0
	Total	174	100.0	100.0	

M action taken on 1st medical consultation

On first medical consultation at PHF majority of patients were given medication and discharged or asked to come back for follow up (70.2%). Table 13 shows the actions taken.

Table 13: action taken on 1st medical consultation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	nothing	1	.6	.6	.6
	given medication & discharged	68	39.1	39.8	40.4
	given medication & follow-up	51	29.3	29.8	70.2
	done surgery/biopsy	23	13.2	13.5	83.6
	referred	26	14.9	15.2	98.8
	done FNA	1	.6	.6	99.4
	given medication & done surgery/biopsy	1	.6	.6	100.0
	Total	171	98.3	100.0	
Missing	System	3	1.7		
Total		174	100.0		

N 1st medical consultation at PHF to KNH referral interval

The interval between first medical consultation and referral to KNH ranged from immediate referral to a worrying 96 weeks. Table 14 shows the mean, median and range.

Table 14: 1st medical consultation at PHF to KNH referral interval in weeks.

Overall mean	13.76
median	8
Range	0-96

O Referral to KNH to presentation at KNH interval

Most patients 148(85.1%) presented at KNH immediately on referral. Table 15 shows the mean, median and range of intervals.

Table 15: Referral to presentation at KNH interval in weeks.

Over all mean	1.42 weeks
median	0
Range	0-60 weeks

P reason for delay to consult immediately at KNH

Only 22 patients of the 174 did not present at KNH immediately on referral. Various reasons were given for the delay by the 22 as shown in table 16

Table 16: P reason for delay after referral to presentation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	distance too far	1	.6	4.0	4.0
	financial problems	13	7.5	52.0	56.0
	didn't think it was serious	1	.6	4.0	60.0
	decided to seek for another opinion	8	4.6	32.0	92.0
	financial & didn't think it was serious	1	.6	4.0	96.0
	financial & decided to seek for another opinion	1	.6	4.0	100.0
	Total	25	14.4	100.0	
Missing	System	149	85.6		
Total		174	100.0		

Q presentation at KNH to 1st consultation interval

On presentation at KNH most patients 154(88.5%) were seen by the specialist immediately.Table17 shows the intervals.

Table 17: Presentation at KNH to 1st specialist consultation interval in weeks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	immediate	154	88.5	88.5	88.5
	1	1	.6	.6	89.1
	2	11	6.3	6.3	95.4
	3	2	1.1	1.1	96.6
	4	4	2.3	2.3	98.9
	7	2	1.1	1.1	100.0
	Total	174	100.0	100.0	

Over all mean	0.34 weeks
median	0
Range	0-7

R presentation at KNH to diagnosis interval

The duration taken for the final histological diagnosis to be made from the date of presentation at KNH ranged from within one week to 4 years. Table 18 shows the intervals, mean, median and range.

Table 18: R presentation at KNH to diagnosis interval in weeks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	same week	5	2.9	3.0	3.0
	1	31	17.8	18.5	21.4
	2	17	9.8	10.1	31.5
	3	12	6.9	7.1	38.7
	4	21	12.1	12.5	51.2
	5	7	4.0	4.2	55.4
	6	19	10.9	11.3	66.7
	7	7	4.0	4.2	70.8
	8	15	8.6	8.9	79.8
	9	4	2.3	2.4	82.1
	10	3	1.7	1.8	83.9
	11	3	1.7	1.8	85.7
	12	5	2.9	3.0	88.7
	13	2	1.1	1.2	89.9
	14	2	1.1	1.2	91.1
	16	6	3.4	3.6	94.6
	24	3	1.7	1.8	96.4
	30	1	.6	.6	97.0
	36	1	.6	.6	97.6
	40	1	.6	.6	98.2
	52	1	.6	.6	98.8
	82	1	.6	.6	99.4
	206	1	.6	.6	100.0

mean	7.92
median	4
Range	0-206

S Duration of symptoms at diagnosis

The duration of symptoms from onset to diagnosis ranged from 4weeks to 10 years. Table 19 shows the mean, median and range.

Table 19: S Duration of symptoms at diagnosis

mean	57.23 weeks
median	42
Range	4-521

T diagnosis by primary site

The primary sites were larynx (LC) 64 (36.8%), Nasopharynx (NPC) 45 (25.9%), Hypopharynx (HyPC) 10(5.7%), oropharynx (OPhC) 15 (8.6%), oral cavity (OcC) 9 (5.2%) sinonasal (SNC) 14(8%), Salivary glands (SGC) 11(6.3%) and others 6 (3.4 %). The later group included a small number with rhabdomyosarcoma, malignant melanoma, Kaposi sarcoma and occult primary. Table 20 shows the diagnosis by primary site.

Table 20: T diagnosis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ca larynx (LC)	64	36.8	36.8	36.8
	nasopharyngeal Ca (NPC)	45	25.9	25.9	62.6
	Ca hypopharynx (HpC)	10	5.7	5.7	68.4
	Ca oropharynx/tonsil (OphC)	15	8.6	8.6	77.0
	Ca tongue/oral cavity (OcC)	9	5.2	5.2	82.2
	Ca sinonasal (SNC)	14	8.0	8.0	90.2
	Ca salivary glands (SGC)	11	6.3	6.3	96.6
	others	6	3.4	3.4	100.0
	Total	174	100.0	100.0	

U stage of disease at presentation TNM

Most patients had T-3 and T-4 stage disease at diagnosis both accounting for 76.2% of total. Neck disease was preset at diagnosis in slightly over 50% of patients. Only 3 patients had distant metastasis but 56 could not be assessed. Table 21a. b and c show the frequency of TNM stage.

Table 21a: U stage of disease at presentation - T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	7.5	7.6	7.6
	2	28	16.1	16.3	23.8
	3	48	27.6	27.9	51.7
	4	83	47.7	48.3	100.0
	Total	172	98.9	100.0	
Missing	System	2	1.1		
Total		174	100.0		

Table 21 b: U stage of disease at presentation - N

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	84	48.3	49.1	49.1
	1	35	20.1	20.5	69.6
	2	20	11.5	11.7	81.3
	3	32	18.4	18.7	100.0
	Total	171	98.3	100.0	
Missing	System	3	1.7		
Total		174	100.0		

Table 21 c: U stage of disease at presentation - M

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	115	66.1	97.5	97.5
	1	3	1.7	2.5	100.0
	Total	118	67.8	100.0	
Missing	System	56	32.2		
Total		174	100.0		

U stage group

At diagnosis majority of patients had stage IV disease 114(65.5%). Table 22 shows the stage distribution.

Table 22: U stage group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I	9	5.2	5.2	5.2
	II	13	7.5	7.5	12.6
	III	38	21.8	21.8	34.5
	IV	114	65.5	65.5	100.0
	Total	174	100.0	100.0	

W: Histology

Over 87% of the patients had squamous cell carcinoma. The histological variants are shown in table 23

Table 23: W: histology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	well differentiated	61	35.1	35.1	35.1
	moderately well differentiated	31	17.8	17.8	52.9
	poorly differentiated	12	6.9	6.9	59.8
	anaplastic	49	28.2	28.2	87.9
	pleomorphic sarcoma	1	.6	.6	88.5
	adenoid cystic Ca	4	2.3	2.3	90.8
	undifferentiated Ca	1	.6	.6	91.4
	adenocarcinoma	6	3.4	3.4	94.8
	rhabdomyosarcoma	3	1.7	1.7	96.6
	malignant melanoma	2	1.1	1.1	97.7
	Kaposi sarcoma	1	.6	.6	98.3
	small cell carcinoma	1	.6	.6	98.9
	ameloblastoma	1	.6	.6	99.4
	clear cell carcinoma (neck)	1	.6	.6	100.0
	Total	174	100.0	100.0	

X distance to nearest health facility

The distance to the nearest health facility ranged from one km to 140kms. Over 86% of patients had access to a health facility within a radius of 20kms. Table 24 shows the distances to the nearest health facility.

Table 24 X distance to nearest health facility in kilometres

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	7	4.0	4.4	4.4
	2	14	8.0	8.8	13.2
	3	21	12.1	13.2	26.4
	4	14	8.0	8.8	35.2
	5	22	12.6	13.8	49.1
	6	2	1.1	1.3	50.3
	8	8	4.6	5.0	55.3
	10	19	10.9	11.9	67.3
	12	1	.6	.6	67.9
	15	18	10.3	11.3	79.2
	20	12	6.9	7.5	86.8
	25	1	.6	.6	87.4
	30	8	4.6	5.0	92.5
	40	3	1.7	1.9	94.3
	45	1	.6	.6	95.0
	50	1	.6	.6	95.6
	55	1	.6	.6	96.2
	70	4	2.3	2.5	98.7
	100	1	.6	.6	99.4
	140	1	.6	.6	100.0
	total	159	91.4	100.0	
Missing	System	15	8.6		
Total		174	100.0		

Y mode of transport to nearest health facility

Over 49% of the patients were within walking distance to the nearest health facility. The cost of transport ranged from Kshs 10 to Kshs 500. Tables 25 and 26 show the distances and cost.

Table 25 transport to nearest health facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	walking	85	48.9	49.7	49.7
	cycling	8	4.6	4.7	54.4
	matatu/PSV	68	39.1	39.8	94.2
	trucks	6	3.4	3.5	97.7
	walking & cycling	2	1.1	1.2	98.8
	walking & matatu/PSV	2	1.1	1.2	100.0
	Total	171	98.3	100.0	
Missing	System	3	1.7		
Total		174	100.0		

Table 26 cost of travel to nearest health facility in Kshs

		Frequency	Percent	Valid Percent	Cumulative
Valid	10	3	1.7	4.1	4.1
	20	7	4.0	9.5	13.5
	30	10	5.7	13.5	27.0
	35	1	.6	1.4	28.4
	40	18	10.3	24.3	52.7
	50	17	9.8	23.0	75.7
	60	2	1.1	2.7	78.4
	70	2	1.1	2.7	81.1
	90	1	.6	1.4	82.4
	100	9	5.2	12.2	94.6
	150	1	.6	1.4	95.9
	200	2	1.1	2.7	98.6
	400	1	.6	1.4	100.0
	500	74	42.5	100.0	
Missing	System	100	57.5		
Total		174	100.0		

AA type of nearest health facility

Community health centres were the nearest PHF to most of the patients. Table 27 shows the types PHF available to the patients.

Table 27 nearest health facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	private doctor/clinic	2	1.1	1.2	1.2
	public dispensary	41	23.6	24.0	25.1
	community health centre	72	41.4	42.1	67.3
	mission hospital/dispensary	16	9.2	9.4	76.6
	private hospital	3	1.7	1.8	78.4
	district/sub-district hospital	29	16.7	17.0	95.3
	provincial hospital	6	3.4	3.5	98.8
	KNH	1	.6	.6	99.4
	private doctor & community health centre	1	.6	.6	100.0
	Total	171	98.3	100.0	
Missing	System	3	1.7		
Total		174	100.0		

AB distance and cost of travel from residence to KNH

The distances from residence to KHN ranged from 5 kms to 1200kms.tables 28 and 29 show the mean, median and range of distance and cost of travel.

Table 28 distance from residence to KNH

Mean	208.4
Median	150
SD	188.24
range	5-1200

Table 29 cost of travel from residence to KNH in Kshs

Mean	385
Median	250
SD	410.604
range	20-2000

Comparison between age group and stage

Patients in the age group 50- 69 years were the majority presenting with early disease. No statistical significance was established between age group and stage at diagnosis.

			U stage group		
			I & II	III & IV	Total
A age group in years	10-19	Count	0	14	14
		% within A age group in years	.0%	100.0%	100.0%
	20-29	Count	2	8	10
		% within A age group in years	20.0%	80.0%	100.0%
	30-39	Count	0	15	15
		% within A age group in years	.0%	100.0%	100.0%
	40-49	Count	2	16	18
		% within A age group in years	11.1%	88.9%	100.0%
	50-59	Count	8	41	49
		% within A age group in years	16.3%	83.7%	100.0%
	60-69	Count	6	35	41
		% within A age group in years	14.6%	85.4%	100.0%
	70 & over	Count	3	20	23
		% within A age group in years	13.0%	87.0%	100.0%
Total		Count	21	149	170
		% within A age group in years	12.4%	87.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.575(a)	6	.472
Likelihood Ratio	8.996	6	.174
Linear-by-Linear Association	1.724	1	.189
N of Valid Cases	170		

a 5 cells (35.7%) have expected count less than 5. The minimum expected count is 1.24.

Comparison between sex and stage group

More males 14 (72.7%) presented with early disease compared to females 6 (27.3%). This was not statistically significant.

			U stage group		
			I & II	III & IV	Total
B sex	male	Count	16	118	134
		% within B sex	11.9%	88.1%	100.0%
		% within U stage group	72.7%	77.6%	77.0%
	female	Count	6	34	40
		% within B sex	15.0%	85.0%	100.0%
		% within U stage group	27.3%	22.4%	23.0%
Total		Count	22	152	174
		% within B sex	12.6%	87.4%	100.0%
		% within U stage group	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.261(b)	1	.609		
Continuity Correction(a)	.058	1	.810		
Likelihood Ratio	.252	1	.615		
Fisher's Exact Test				.595	.392
Linear-by-Linear Association	.260	1	.610		
N of Valid Cases	174				

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.06.

Comparison between province of residence and stage group

Half of the patients 11 (50%) presenting with early disease came from central Kenya but Province of residence was did not correlate with stage at diagnosis statistically.

			U stage group		
			I & II	III & IV	Total
C province of residence	Central	Count	11	58	69
		% within C province of residence	15.9%	84.1%	100.0%
	Eastern	Count	3	42	45
		% within C province of residence	6.7%	93.3%	100.0%
	Coast	Count	0	5	5
		% within C province of residence	.0%	100.0%	100.0%
	Nairobi	Count	1	4	5
		% within C province of residence	20.0%	80.0%	100.0%
	Rift Valley	Count	1	11	12
		% within C province of residence	8.3%	91.7%	100.0%
	Nyanza	Count	2	18	20
		% within C province of residence	10.0%	90.0%	100.0%
	North Eastern	Count	0	5	5
		% within C province of residence	.0%	100.0%	100.0%
	Western	Count	4	9	13
		% within C province of residence	30.8%	69.2%	100.0%
Total		Count	22	152	174
		% within C province of residence	12.6%	87.4%	100.0%

Comparison between occupation and stage group

Majority of patients presenting with early disease were unemployed, subsistence farmers or petty traders 14 (72.7%). Occupation of patients and stage at diagnosis were not correlated in this study.

			U stage group		
			I & II	III & IV	Total
D occupation	unemployed	Count	5	37	42
		% within D occupation	11.9%	88.1%	100.0%
	subsistence farmer	Count	6	58	64
		% within D occupation	9.4%	90.6%	100.0%
	petty trader	Count	5	10	15
		% within D occupation	33.3%	66.7%	100.0%
	farm labourer	Count	0	1	1
		% within D occupation	.0%	100.0%	100.0%
	industrial labourer	Count	0	2	2
		% within D occupation	.0%	100.0%	100.0%
	housewife	Count	2	8	10
		% within D occupation	20.0%	80.0%	100.0%
	casual labourer	Count	0	3	3
		% within D occupation	.0%	100.0%	100.0%
	student	Count	0	9	9
		% within D occupation	.0%	100.0%	100.0%
	servant	Count	0	3	3
		% within D occupation	.0%	100.0%	100.0%
	artisan	Count	0	4	4
		% within D occupation	.0%	100.0%	100.0%
	professional	Count	2	11	13
		% within D occupation	15.4%	84.6%	100.0%
	driver	Count	2	6	8
		% within D occupation	25.0%	75.0%	100.0%
Total		Count	22	152	174
		% within D occupation	12.6%	87.4%	100.0%

Comparison between education level and stage group

The level of education and stage at diagnosis could not be tested statistically as most patients had the same education background. Patient with the primary education 10 (45.5%) presented with early disease.

			U stage group		Total
			I & II	III & IV	
E education level	none	Count	5	41	46
		% within E education level	10.9%	89.1%	100.0%
		% within U stage group	22.7%	27.0%	26.4%
	primary	Count	10	66	76
		% within E education level	13.2%	86.8%	100.0%
		% within U stage group	45.5%	43.4%	43.7%
	technical training post primary	Count	2	4	6
		% within E education level	33.3%	66.7%	100.0%
		% within U stage group	9.1%	2.6%	3.4%
	secondary	Count	4	28	32
		% within E education level	12.5%	87.5%	100.0%
		% within U stage group	18.2%	18.4%	18.4%
	post secondary certificate	Count	0	11	11
		% within E education level	.0%	100.0%	100.0%
		% within U stage group	.0%	7.2%	6.3%
	university	Count	1	2	3
		% within E education level	33.3%	66.7%	100.0%
		% within U stage group	4.5%	1.3%	1.7%
Total		Count	22	152	174
		% within E education level	12.6%	87.4%	100.0%
		% within U stage group	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.230(a)	5	.388
Likelihood Ratio	5.702	5	.336
Linear-by-Linear Association	.002	1	.962
N of Valid Cases	174		

a 5 cells (41.7%) have expected count less than 5. The minimum expected count is .38.

Comparison between housing type and stage group

The type of housing had no correlation with stage at diagnosis statistically.

			U stage group		Total
			I & II	III & IV	
F housing	temporary/makeshift	Count	4	46	50
		% within F housing	8.0%	92.0%	100.0%
		% within U stage group	18.2%	30.3%	28.7%
	semi-permanent	Count	12	71	83
		% within F housing	14.5%	85.5%	100.0%
		% within U stage group	54.5%	46.7%	47.7%.
	permanent	Count	6	35	41
		% within F housing	14.6%	85.4%	100.0%
		% within U stage group	27.3%	23.0%	23.6%
Total		Count	22	152	174
		% within F housing	12.6%	87.4%	100.0%
		% within U stage group	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.371(a)	2	.504
Likelihood Ratio	1.482	2	.477
Linear-by-Linear Association	.979	1	.322
N of Valid Cases	174		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.18.

Comparison between Income and stage group

Patients with income level above Kshs. 200 per day were the majority presenting with early disease. No statistical significance was established between level of income and stage of diagnosis.

			U stage group		
			I & II	III & IV	Total
G Income in kshs per day	< 100 Kshs.	Count	7	71	78
		% within G Income in kshs per day	9.0%	91.0%	100.0%
		% within U stage group	35.0%	49.0%	47.3%
	100 - < 200	Count	4	43	47
		% within G Income in kshs per day	8.5%	91.5%	100.0%
		% within U stage group	20.0%	29.7%	28.5%
	200 & over	Count	9	31	40
		% within G Income in kshs per day	22.5%	77.5%	100.0%
		% within U stage group	45.0%	21.4%	24.2%
Total		Count	20	145	165
		% within G Income in kshs per day	12.1%	87.9%	100.0%
		% within U stage group	100.0%	100.0%	100.0%

Comparison between 1st Health facility medical consultations made and stage group

Patients presenting at community health center for first consultation were the majority presenting with early disease 8 (36.4%). There was no statistical significance between type of health facility 1st attended and stage at diagnosis.

			U stage group		Total
			I & II	III & IV	
K 1st H/facility medical consultation made	private doctor/clinic	Count	4	13	17
		% within K 1st H/facility medical consultation made	23.5%	76.5%	100.0%
	public dispensary	Count	1	27	28
		% within K 1st H/facility medical consultation made	3.6%	96.4%	100.0%
	community health centre	Count	8	45	53
		% within K 1st H/facility medical consultation made	15.1%	84.9%	100.0%
	mission hospital/dispensary	Count	2	18	20
		% within K 1st H/facility medical consultation made	10.0%	90.0%	100.0%
	district/sub-district hospital	Count	3	31	34
		% within K 1st H/facility medical consultation made	8.8%	91.2%	100.0%
	provincial hospital	Count	2	6	8
		% within K 1st H/facility medical consultation made	25.0%	75.0%	100.0%
	pharmacy/chemist	Count	2	0	2
		% within K 1st H/facility medical consultation made	100.0%	.0%	100.0%
	traditional/faith healer	Count	0	1	1
		% within K 1st H/facility medical consultation made	.0%	100.0%	100.0%
	outreach programme	Count	0	7	7
		% within K 1st H/facility medical consultation made	.0%	100.0%	100.0%
	KNH	Count	0	3	3
		% within K 1st H/facility medical consultation made	.0%	100.0%	100.0%
		% within U stage group	.0%	2.0%	1.7%

	community health centre & KNH	Count	0	1	1
		% within K 1st H/facility medical consultation made	.0%	100.0%	100.0%
Total		Count	22	152	174
		% within K 1st H/facility medical consultation made	12.6%	87.4%	100.0%

Comparison between cadre of personnel seen at 1st consultation and stage group

Patients 1st seen by a medical officer were more likely to be diagnosed with early disease compared to other cadre (21.1%) of health personnel. However statistical significance could not be established.

			U stage group		Total
			I & II	III & IV	
L cadre of personnel seen at 1st consultation	nurse assistant	Count	0	1	1
		% within L cadre of personnel seen at 1st consultation	.0%	100.0%	100.0%
		% within U stage group	.0%	.7%	.6%
	Nurse	Count	0	23	23
		% within L cadre of personnel seen at 1st consultation	.0%	100.0%	100.0%
		% within U stage group	.0%	15.1%	13.2%
	clinical officer	Count	9	82	91
		% within L cadre of personnel seen at 1st consultation	9.9%	90.1%	100.0%
		% within U stage group	40.9%	53.9%	52.3%
	medical officer	Count	8	30	38
		% within L cadre of personnel seen at 1st consultation	21.1%	78.9%	100.0%
		% within U stage group	36.4%	19.7%	21.8%
	ENT surgeon	Count	3	15	18
		% within L cadre of personnel seen at 1st consultation	16.7%	83.3%	100.0%
		% within U stage group	13.6%	9.9%	10.3%
	haematologist	Count	0	1	1
		% within L cadre of personnel seen at 1st consultation	.0%	100.0%	100.0%
		% within U stage group	.0%	.7%	.6%
	Pharmacist	Count	2	0	2
		% within L cadre of personnel seen at 1st consultation	100.0%	.0%	100.0%
		% within U stage group	9.1%	.0%	1.1%
Total		Count	22	152	174
		% within L cadre of personnel seen at 1st consultation	12.6%	87.4%	100.0%
		% within U stage group	100.0%	100.0%	100.0%

Comparison between primary site diagnosis and stage group

Patients with LC and OCC were the majority with early disease compared to other primary sites. Statistical significance could not be established because of the sample size.

			U stage group		Total
			I & II	III & IV	
T diagnosis	Ca larynx (LC)	Count	16	48	64
		% within T diagnosis	25.0%	75.0%	100.0%
		% within U stage group	72.7%	31.6%	36.8%
	nasopharyngeal Ca (NPC)	Count	2	43	45
		% within T diagnosis	4.4%	95.6%	100.0%
		% within U stage group	9.1%	28.3%	25.9%
	Ca hypopharynx (HpC)	Count	0	10	10
		% within T diagnosis	.0%	100.0%	100.0%
		% within U stage group	.0%	6.6%	5.7%
	Ca oropharynx/tonsil (OphC)	Count	1	14	15
		% within T diagnosis	6.7%	93.3%	100.0%
		% within U stage group	4.5%	9.2%	8.6%
	Ca tongue/oral cavity (OcC)	Count	3	6	9
		% within T diagnosis	33.3%	66.7%	100.0%
		% within U stage group	13.6%	3.9%	5.2%
	Ca sinonasal (SNC)	Count	0	14	14
		% within T diagnosis	.0%	100.0%	100.0%
		% within U stage group	.0%	9.2%	8.0%
	Ca salivary glands (SGC)	Count	0	11	11
		% within T diagnosis	.0%	100.0%	100.0%
		% within U stage group	.0%	7.2%	6.3%
	others	Count	0	6	6
		% within T diagnosis	.0%	100.0%	100.0%
		% within U stage group	.0%	3.9%	3.4%
Total		Count	22	152	174
		% within T diagnosis	12.6%	87.4%	100.0%
		% within U stage group	100.0%	100.0%	100.0%

Comparison between histological diagnosis and stage group

Patients with well-differentiated SCC were the majority with early disease 12 (50%). This was not statistically significant

			U stage group		
			I & II	III & IV	Total
W histology	well differentiated	Count	12	49	61
		% within W histology	19.7%	80.3%	100.0%
	moderately well differentiated	Count	8	23	31
		% within W histology	25.8%	74.2%	100.0%
	poorly differentiated	Count	0	12	12
		% within W histology	.0%	100.0%	100.0%
	anaplastic	Count	2	47	49
		% within W histology	4.1%	95.9%	100.0%
	pliomorphic sarcoma	Count	0	1	1
		% within W histology	.0%	100.0%	100.0%
	adenoid cystic Ca	Count	0	4	4
		% within W histology	.0%	100.0%	100.0%
	undifferentiated Ca	Count	0	1	1
		% within W histology	.0%	100.0%	100.0%
	adenocarcinoma	Count	0	6	6
		% within W histology	.0%	100.0%	100.0%
	rhabdomyosarcoma	Count	0	3	3
		% within W histology	.0%	100.0%	100.0%
	malignant melanoma	Count	0	2	2
		% within W histology	.0%	100.0%	100.0%
	kaposi sarcoma	Count	0	1	1
		% within W histology	.0%	100.0%	100.0%
	small cell carcinoma	Count	0	1	1
		% within W histology	.0%	100.0%	100.0%
	ameloblastoma	Count	0	1	1
		% within W histology	.0%	100.0%	100.0%
	clear cell carcinoma (neck)	Count	0	1	1
		% within W histology	.0%	100.0%	100.0%
Total		Count	22	152	174
		% within W histology	12.6%	87.4%	100.0%

Comparison between mode of transport to nearest health facility and stage group

Patients within walking distance to PHF were diagnosed with early disease 15(68.2%) compared to those who used other modes of transport. This was not statistically significance

			U stage group		Total
			I & II	III & IV	
Y mode of transport to nearest health facility	walking	Count	15	70	85
		% within Y mode of transport to nearest health facility	17.6%	82.4%	100.0%
	cycling	Count	0	8	8
		% within Y mode of transport to nearest health facility	.0%	100.0%	100.0%
	matatu/PSV	Count	6	62	68
		% within Y mode of transport to nearest health facility	8.8%	91.2%	100.0%
	trucks	Count	0	6	6
		% within Y mode of transport to nearest health facility	.0%	100.0%	100.0%
	walking & cycling	Count	0	2	2
		% within Y mode of transport to nearest health facility	.0%	100.0%	100.0%
	walking & matatu/PSV	Count	1	1	2
		% within Y mode of transport to nearest health facility	50.0%	50.0%	100.0%
Total		Count	22	149	171
		% within Y mode of transport to nearest health facility	12.9%	87.1%	100.0%

Comparison between type of nearest health facility and stage group

The type of nearest PHF did not have statistical significance with stage at diagnosis.

		U stage group		Total
		I & II	III & IV	
A private doctor/clinic	Count	1	1	2
	% within AA type of nearest health facility	50.0%	50.0%	100.0%
	% within U stage group	4.5%	.7%	1.2%
public dispensary	Count	2	39	41
	% within AA type of nearest health facility	4.9%	95.1%	100.0%
	% within U stage group	9.1%	26.2%	24.0%
community health centre	Count	12	60	72
	% within AA type of nearest health facility	16.7%	83.3%	100.0%
	% within U stage group	54.5%	40.3%	42.1%
mission hospital/dispensary	Count	2	14	16
	% within AA type of nearest health facility	12.5%	87.5%	100.0%
	% within U stage group	9.1%	9.4%	9.4%
private hospital	Count	3	0	3
	% within AA type of nearest health facility	100.0%	.0%	100.0%
	% within U stage group	13.6%	.0%	1.8%
district/sub-district hospital	Count	2	27	29
	% within AA type of nearest health facility	6.9%	93.1%	100.0%
	% within U stage group	9.1%	18.1%	17.0%
provincial hospital	Count	0	6	6
	% within AA type of nearest health facility	.0%	100.0%	100.0%
	% within U stage group	.0%	4.0%	3.5%
KNH	Count	0	1	1
	% within AA type of nearest health facility	.0%	100.0%	100.0%
	% within U stage group	.0%	.7%	.6%
private doctor & community health centre	Count	0	1	1
	% within AA type of nearest health facility	.0%	100.0%	100.0%
	% within U stage group	.0%	.7%	.6%
Total	Count	22	149	171
	% within AA type of nearest health facility	12.9%	87.1%	100.0%
	% within U stage group	100.0%	100.0%	100.0%

SUMMARY OF REULTS

One hundred and seventy four patients being managed for Head and Neck Cancer (HNC) at Kenyatta National hospital were reviewed.

Overall 152 (87.3%) patients had stage III & IV disease and 22 (12.6%) had stage II and I.
Most of the patients in the study were in the 6^{th} to 8^{th} decade of life 66.4%. No statistical significance was established between age and stage at diagnosis

There were 134 (77%) males and 40 (23%) females. The male to female ratio was 3.35:1. There was no statistical significance of sex and stage at diagnosis.

The primary sites were larynx (LC) 64 (36.8%), Nasopharynx (NPC) 45 (25.9%), Hypopharynx (HyPC) 10(5.7%), oropharynx (OPhC) 15 (8.6%), oral cavity (OcC) 9 (5.2%) sinonasal (SNC) 14(8%), Salivary glands (SGC) 11(6.3%) and others 6 (3.4 %). The later group included a small number with rhabdomyosarcoma, malignant melanoma, Kaposi sarcoma and occult primary. Primary site was did not correlate with stage at diagnosis statistically.

Over 87% of the patients had squamous cell carcinoma. The histological diagnosis was not statistically significant as a determinant of early diagnosis.

The majority of the patients came from Central and Eastern provinces of Kenya 39.9% and 25.4% respectively accounting for 65.3% of total. These are the provinces bordering Nairobi and could as well explain the high percentage of patients being seen at KNH. No statistical significance was established between locality of the patient (province) and stage at diagnosis.

Most patients were unemployed, subsistence farmers or petty traders. There was no statistical significance of occupation and stage at diagnosis.

The level of education for majority of patients was primary level or no formal education. 70.1%. No statistical significance was established between level of education and stage at diagnosis.

Patients in this study were mainly poor or living below the poverty line 75.8%. Level of income would not be tested for statistical significance as a determinal for stage at diagnosis.

The symptoms of HNC appear early but are treated as minor illness by both the patients' and PHF health care providers. This is evidenced in the study by the action taken and the duration taken to seek medical advice and referred for specialist care. The mean duration of symptoms for all primary sites at diagnosis was 57.23 weeks (range 4 – 521). The median duration of symptoms for patients with stage I & II disease was 54 weeks (range 20-521) while those with stage III & IV disease was 41 weeks (Range 4-426).

The duration between presentation at PHF to diagnosis (21.73 weeks) has improved compared to a previous local study which showed 8.7 months for NPC and LC. There is still need to improve this if early diagnosis is to be achieved. There was no statistical significance between duration of symptoms and stage at diagnosis.

Only 22 patients of the 174 did not present at KNH immediately on referral.

Most patients had access to PHF within walking distance. Community Health Center and public dispensaries were the main type of PHF 66.1% nearest to most patients.

The type of PHF first visited could not be tested for statistical significance as determinant of stage at diagnosis.

The vast majority of the patients were first seen by a nurse or a clinical officer (66.1%). No statistical significant was established between the cadre of personnel first seen and the stage at diagnosis.

The mean distance form patient residence to KNH is 208.44 km (range 5-1200 km). The mean cost of travel to KNH was Kshs 385 (range 20-2000). No correlation was shown between distance to PHF and KNH to stage as presentation.

On presentation at KNH most patients were seen by the specialist immediately or with one week.

DISCUSSION OF STUDY

In this study late diagnosis of HNC at KNH is well demonstrated with only 22(12.6%) of patients out of 174 being diagnosed with early disease for all primary sites. In this study patients with oral cavity and laryngeal cancer are more likely to be diagnosed with early diseases (25% and 33.3% respectively) compared to other primary sites. This compares with other studies (26, 3). HyPC, NPC, SNC and SGC have the highest tendency to be diagnosed late. A local study has demonstrated these findings for LC and NPC (4).

The duration of symptoms at diagnosis was found to be unacceptably long at 57.23 weeks average. Patient delay accounted for 35.29 weeks, presentation at PHF to referral for specialized management 13.76 weeks and professional diagnostic delay at KNH 7.97 weeks. Patient delay was found to be the major contributing factor to prolonged duration of symptoms at diagnosis followed by presentation at PHF to referral to KNH. Professional diagnostic delay at KNH of 7.97 weeks is still not acceptable. In the study of Allison (27) professional delay of more than one month was found to contribute to an increased risk of late stage diagnosis. In the study of Andre et al (30) both patient and professional delays were associated with advanced disease at diagnosis, with patient delay being a stronger predictive factor than professional delay.

The symptoms of HNC appear early but are dismissed as minor illness by both the patients and PHF care providers as evidenced in this study.

To address the issue of prolonged duration of symptoms at diagnosis the general public, the high risk groups and PHF care providers need health education on the early symptoms of HNC and the importance of early expert advice hence prompt referral. Professional diagnostic delay at KNH also needs to be addressed if improvement is to be expected in early diagnosis.

In this study there were some encouraging observations. Most people have access to PHF within walking distance or within a radius of less than 20 KM (86.8%). Upon referral to KNH most patients present immediately though one cannot tell if this is due to the advanced nature of the disease and hence desperation on the part of the patient and relatives. Another encouraging observation is that the specialist at KHN sees patients within the same week of presentation (Mean-0.34 weeks). Again one needs to look whether it is because of the advanced nature of disease and hence life threatening and poor state of the patient at presentation at KNH calling for immediate attention.

There were some discouraging observations from this study. Majority of our patients are poor or living below poverty line (80.6%). The level of education for majority is also low with 73.4% having only up to primary level or no formal education. The control group in this study (patients will stage 1 & II diseased) is quite small and also most of the patients in the sample have almost similar parameters being tested as determinants factors for late presentation and have statistical significance could not found.

The results of this study unfortunately suggest that the potential for increasing the proportion of patients being diagnosed with early disease is very limited as no relationship was established between duration of symptoms, socioeconomic status, education level, distance and cost to health facilities and stage as diagnosis.

RECOMMENDATIONS

1. Duration of symptom at diagnosis is disturbingly long with patient delay and inefficient referral system being the major contributor. The general public, high-risk groups and primary health care providers health education is paramount if this is to be addressed. In this study majority of patients resulted did self medication with over the counter drugs. This group of health care providers selling the drugs should be a major target in heath education. This should focus on early symptoms of HNC (which present early) and the need for early specialist advice.
2. The professional diagnostic delays in KNH also need to be addressed. From the study the cause of delay seems to be administrative or without the ENT/HN specialist control as most patients are attended by the specialist within the same week of presentation at KHN.
3. Another study to look at the determinants of late presentation. In the suggested study the control group should be bigger.

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ANNEX I

RULES OF THE AMERICAN JOINT COMMITTEE ON CANCER-INTERNATIONAL UNION AGAINST CANCER SYSTEM

Physical examination, radiographic studies such as computed tomography (CT) scan and magnetic resonance imaging (MRI), endoscopy, and biopsy should be considered when determining the final clinical stage of a patient before treatment is initiated. When there is doubt regarding which stage to apply, it is recommended that the lower stage be selected.

T_X	Primary tumor cannot be assessed
T_0	No evidence of primary tumor
T_{is}	Carcinoma in situ

Lymph node (N)-except for the nasopharynx

N_X	Regional lymph nodes cannot be assessed
N_0	No regional lymph node metastasis
N_1	Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension
N_2	Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension, or multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, or bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
2a	Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension
2b	Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension
2c	Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N_3	Metastasis in a lymph node more than 6 cm in greatest dimension

CURRENT HEAD AND NECK CANCER STAGING (AJCC-UICC)

T stage

Lip and oral cavity

T_1	Tumor 2 cm or less in greatest dimension
T_2	Tumor more than 2 cm but not more than 4 cm in greatest dimension
T_3	Tumor more than 4 cm in greatest dimension
T_4 (Lip)	Tumor invades adjacent structures, e.g., through cortical bone, tongue, and skin of neck
T_4 (Oral cavity)	Tumor invades adjacent structures, e.g., through cortical bone, into deep (extrinsic) muscle of tongue, maxillary sinus, skin

Pharynx (including base of tongue, soft palate, and uvula)

Primary tumor (T)

Oropharynx

T_1	Tumor 2 cm or less in greatest dimension
T_2	Tumor more than 2 cm but not more than 4 cm in greatest dimension
T_3	Tumor more than 4 cm in greatest dimension
T_4	Tumor invades adjacent structures, e.g., through cortical bone, soft tissue of neck, deep (extrinsic) muscle of tongue

Nasopharynx

T_1	Tumor limited to nasopharynx
T_2	Tumor extends to soft tissues
2a	Tumour extends to oropharynx or nasal cavity without parapharyngeal extension
2b	Tumour with parapharyngeal extension
T_3	Tumor invades bony structures or paranasal sinuses
T_4	Tumor invades cranial nerve(s), intracranial extension, infratemporal fossa, hypopharynx, orbit or masticator space

Lymph Node (N) – nasopharynx

N_X	Regional lymph nodes cannot be assessed
N_0	No regional lymph node metastasis
N_1	Unilateral metastasis in lymph node(s) 6cm or less in greatest dimension, above the supraclavicular fossa
N_2	Bilateral metastasis in lymph node(s) 6cm or less in greatest dimension, above the supraclavicular fossa
N_3	Metastasis in lymph node(s) greater than 6cm and/or to supraclavicular fossa

Hypopharynx

T_1	Tumor limited to one subsite of hypopharynx
T_2	Tumor invades more than one subsite of hypopharynx or an adjacent site, without fixation of hemilarynx
T_3	Tumor invades more than one subsite of hypopharynx or an adjacent site, with fixation of hemilarynx
T4	Tumor invades adjacent structures, e.g., cartilage or soft tissues of neck

Larynx. Primary tumor (T)

Supraglottis

T1	Tumor limited to one subsite of supraglottis with normal vocal cord mobility
T2	Tumor invades more than one subsite of supraglottis or glottis, with normal vocal cord mobility
T3	Tumor limited to larynx with vocal cord fixation or invades postcricoid area, medial wall of piriform sinus, or preepiglottic tissues
T4	Tumor invades through thyroid cartilage or extends to other tissues beyond the larynx, e.g., to oropharynx, soft tissues of neck

Glottis

T1	Tumor limited to vocal cord(s) (may involve anterior or posterior commissures) with normal mobility
T1a	Tumor limited to one vocal cord
T1b	Tumor involves both vocal cords
T2	Tumor extends to supraglottis or subglottis, or with impaired vocal cord mobility
T3	Tumor limited to larynx with vocal cord fixation
T4	Tumor invades through thyroid cartilage, or extends to other tissues beyond the larynx e.g., oropharynx, soft tissues of neck

Subglottis

T1	Tumor limited to the subglottis

T2	Tumor extends to vocal cord(s) with normal or impaired mobility
T3	Tumor limited to larynx with vocal cord fixation
T4	Tumor invades through cricoid or thyroid cartilage, or extends to other tissues beyond the larynx, e.g., oropharynx, soft tissues of neck

Maxillary sinus

Primary tumor (T)

T1	Tumor limited to the antral mucosa with no erosion or destruction of bone
T2	Tumor with erosion or destruction of the infrastructure including the hard palate or the middle nasal meatus
T3	Tumor invades any of the following: skin of cheek, posterior wall of the maxillary sinus, floor or medial wall of orbit, anterior ethmoid sinus
T4	Tumor invades orbital contents or any of the following: cribriform plate, posterior ethmoid or sphenoid sinuses, nasopharynx, soft palate, pterygomaxillary or temporal fossae or base of skull

Salivary glands

Primary tumor (T)

T_1	Tumor 2 cm or less in greatest dimension
T_2	Tumor more than 2 cm but not more than 4 cm in greatest dimension
T_3	Tumor more than 4 cm but not more than 6 cm in greatest dimension
T_4	Tumor more than 6 cm in greatest dimension

STAGE GROUPING

The intent of clustering various combinations of TNM into stage groupings is to indicate a stratification of prognosis.

Stage grouping			
Stage 0	Tis	M0	N0
Stage I	T1	M0	N0
Stage II	T2	N0	M0
Stage III	T3	N0	M0
	T1	N1	M0
	T2	N1	M0
	T3	N1	M0
Stage 1V	T4	N0	M0
	T4	N1	M0
	Any T	N2	M0
	Any T	N3	M0
	Any T	Any N	M1

Whereas this system is accurate for the early stages (I and II), it is clear that even in the lower stages, multiple additional factors must be considered to refine the staging system.

CONSENT INFORMATION.

I would like you to give me your consent to participate in my study aimed at understanding why people with the kind of disease you have mostly come to our hospital when the disease is at an advanced stage making cure more difficult to achieve. If we can know this and discover that there things that can be avoided so that our patients come when the disease is at an stage we shall be able to advice and manage our patients better.

I will ask you questions as to how the disease developed, how you have followed up from the time your symptoms started up to now and any factors that might have contributed to you developing the disease.

This study will not affect you negatively at all because what I shall be doing in the study is part of what is done to all patients with the nature of disease you have in the course of treatment planning.

All the information you give will be confidential and the results will not reveal your identity.

If you object to participate in this study you are free to do so and this will not affect the nature of treatment offered to you.

Like all scientific information I will share my findings with other people in the medical field and may publish my findings in scientific journals or present them in meetings.

If you would like to consult with family first you are free to do so.

If you are satisfied and are willing to participate then please sign the consent form below.