

Abstract: Para Clinical Sciences

HPLC in Characterization of Hemoglobin Profile in Thalassemia Syndromes and Hemoglobinopathies: A Clinicohematological Correlation

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INTRODUCTION

Hemoglobinopathies are one of the major public health problems in India. WHO figure states that about 370,000 severely affected homozygotes or compound heterozygotes of thalassemia are born every year. The frequency of β -thalassemia in India ranges from 3.5 to 15% in general population. The aim of the study was to use HPLC in characterization of hemoglobin profile in thalassemia syndromes and hemoglobinopathies.

METHODS

During the period from June 2019 to May 2020, 104 patients fulfilling the inclusion and exclusion criteria were included. A 5 ml EDTA blood sample was collected and was run on automated hematology analyser (Sysmex XN1000) for hemogram and red cell indices; PBF study was done and the same sample was analysed by HPLC using variant II β -thalassemia short program.

RESULTS

HPLC is an excellent, powerful diagnostic tool for the direct identification of hemoglobin variants with a high degree of precision in the quantification of normal and abnormal hemoglobin fractions. Hemoglobin variants that are eluted in the same window can be differentiated according to the retention time and the percentage of different hemoglobins obtained.

CONCLUSION

RBC indices, HPLC finding, and family study are sufficient to detect and manage most of the hemoglobin variants prevalent in our country.

Histopathological Study of Epidermal and Adnexal Tumors and Tumor like Lesions

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INTRODUCTION

Keratinocytic tumours and tumor-like lesions account for approximately 90% of all skin malignancies. This study aimed to describe epidermal and adnexal tumors and tumor like lesions histopathologically.

METHODS

The study was carried out over a period of one year, using routine hematoxylin eosin and special stains in 484 cases. Slides were evaluated by light microscopy.

RESULTS

Epidermal tumors were most common (75%) followed by adnexal tumors (20%) and melanocytic tumors (5%). Among epidermal tumors, epidermal cyst was most common followed by warty dyskeratosis, dermoid cyst, fibro-epithelial polyp, cornu, keratoacanthoma, linear epidermal nevus, seborrheic keratosis, and squamous papilloma. Out of 28 malignant epidermal neoplasm, squamous cell carcinoma was most common, followed by basal cell carcinoma and verrucous carcinoma. Male to female ratio was 2.3:1. Among melanocytic tumors, 15 were benign nevus and 9 were malignant melanoma, and more common in the age group of 21-40 years. Among adnexal tumors, 94 were benign and 3 malignant. Trichilemmal cysts formed more than half of the cases followed by pilomatricoma and eccrine poroma. Malignant adnexal neoplasms were 3.1% of all adnexal tumors and tumor like lesions. Male to female ratio of adnexal neoplasm was 1:1.04. The incidence of benign adnexal neoplasm was more common in the age of 21-40 years while of malignant was more in 21-60 years of age.

CONCLUSION

History, clinical features, site, size of biopsy, and clinical diagnosis give us a probable diagnosis while histopathological examination of the tissue gives us a complete, correct, and a final diagnosis.

Assessment of Prevalence of Major Risk Factors of Non Communicable Diseases with Special Emphasis on Diabetes Mellitus among Doctors in Urban Bikaner

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INTRODUCTION

Physicians have traditionally neglected their own health in favor of their many professional and personal obligations. There has been less research to date into lifestyle behaviors and preventive health care among physicians. This study aimed to determine the prevalence of major risk factors of non-communicable diseases among study population and association with diabetes mellitus.

METHODS

This was a cross sectional study including 297 doctors with minimum qualification of MBBS/BDS, working in Government health care facilities of urban Bikaner, from December 2019 to May 2020.

RESULTS

Mean age of study population was 42.58 ± 9.21 years. It was found that there were 10.78% current smokers, 9.18% consumed ≥ 6 drinks per occasion, 66% were consuming <5 fruit servings per day, 75% were consuming >5 gm salt per day, 49.84% were physically inactive, 46.47% were overweight and 6.73% were obese, 14.14% had systolic BP ≥ 140 mmHg, and diabetes mellitus was present in 15.82%. Diabetes mellitus was significantly associated with age group, gender, alcohol use, overweight and obesity, raised blood pressure, and raised total cholesterol ($p < 0.05$).

CONCLUSION

The prevalence of risk factors for lifestyle diseases was high among the health professionals. In this study, prevalence of diabetes mellitus was higher than the WHO estimated prevalence of DM for India. Modifiable associated risk factors were current tobacco use, current alcohol use, raised blood pressure, and raised total cholesterol.

A Study of Seroprevalence and Risk Factors of *Hepatitis B* Surface Antigen among Pregnant Women attending ANC Clinic in a Tertiary Care Hospital

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INTRODUCTION

India falls in the intermediate endemicity zone of *HBV* infection (prevalence of 27%, with an average of 4%). The age of acquisition of *HBV* is an important determinant of outcome; the earlier the age, the higher the risk of chronicity (e.g., $>90\%$ vertical transmission in new-borns, 30% in children aged 25 years, and $<5\%$ in adults). The present study aimed to estimate seroprevalence of *HBV* infection and to identify associated risk factors among pregnant women attending ANC clinic.

METHODS

The study was a hospital based cross sectional study of 6 months duration. All pregnant women attending antenatal clinic (ANC) at Pannadhay Zanana Hospital (MBGH) Udaipur during the study period were included.

RESULTS

Overall seroprevalence rate of HBsAg among pregnant women was found to be 2.8%. Most common age group of HBsAg seroprevalence was less than 20 years with seroprevalence rate of 3/44 (6.9%). High seroprevalence rate of 8/162 (4.9%) was found in illiterate pregnant women followed by those having primary education 9/230 (3.9%). Seroprevalence rate was found high in multi-gravida 20/510 (3.9%), in women who were delivered by caesarean section in their previous pregnancy 13/217 (6%), in women who had history of surgical intervention 15/319 (4.7%), and in IUD users 5/107 (4.7%).

CONCLUSION

Appropriate antenatal screening and proper preventive and timely interventional measures targeted at all pregnant women are recommended in order to avoid vertical transmission of *HBV* infection.

A Study of Seroprevalence of Hepatitis Delta Virus (HDV) in Hepatitis B Virus Reactive Blood Donors at a Tertiary Care Hospital in Western Part of Rajasthan, India

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INTRODUCTION

Blood transfusion carries the risk of transmitting major infections such as hepatitis, *HIV*, syphilis, and malaria. *Hepatitis Delta Virus (HDV)* is a co-infection of *Hepatitis B Virus (HBV)*. Studies from various parts of India since 1990 shows variable prevalence rate of *HDV*. The present study was undertaken to evaluate the seroprevalence of *HDV* among *HBV* reactive blood donors.

METHODS

This blood bank based prospective study was conducted on blood donors found reactive for HBsAg during routine screening for transfusion transmitted infections from January 2020 to December 2020. All the healthy blood donors were screened for anti-*HIV 1* and 2, HBsAg, anti-*HCV*, syphilis, and malaria. Thus found HBsAg seropositive samples were further screened for anti *Hepatitis D* antibody.

RESULTS

Out of total 27450 blood donors, 240 were found reactive for HBsAg. These 240 HBsAg reactive donors were further investigated for anti *Hepatitis D* antibody. Out of them, two cases were found positive for anti *Hepatitis D* antibody showing prevalence of *HDV* among the *Hepatitis B* reactive blood donors as 0.83%.

CONCLUSION

The results of present study show that the seroprevalence of *Hepatitis D* among the HBsAg reactive blood donors was very low in western part of Rajasthan.

To Study the Clinicopathological Spectrum of Urothelial Bladder Neoplasms with Special Reference to Her2/Neu, p53 and p63

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INTRODUCTION

Urothelial bladder neoplasms predominantly occur in elderly age group and with a history of smoking. p53 is the most commonly mutated gene in cancer and p63 usually expressed in basal layer of urothelium is reduced in invasive carcinomas. This study aimed to observe the clinico-pathological spectrum of urothelial bladder neoplasms and expression of Her2/neu, p53, and p63 and to correlate with tumour grades and stages.

METHODS

Total 96 cases of urothelial bladder neoplasms were received and examined. Hematoxylin and eosin and immunohistochemical markers- Her2/neu, p53, and p63 were applied. The study was carried out for a duration of 1 year.

RESULTS

The patients were in the age range of 30 to 90 years with a mean age of 61.68 years and a male predominance (M: F-5.85:1). Smokers constituted 69 cases and haematuria was the chief complain in 89 patients. Sixty four cases were high grade urothelial carcinomas, 28 were low grade, and four cases were PUNLMP. Sixty two cases were non-invasive while 34 were muscle invasive. Her2/neu was over expressed in 43.75%, p53 in 84.37%, and p63 reduced expression in 87.5% of urothelial carcinomas. Maximum Her2/ neu expression was found in high grades and higher stage (T2) with significant correlation, $p = 0.01$ and $p = 0.007$, respectively.

CONCLUSION

Increased p53 expression and reduced p63 expression was found in higher grades and stages of neoplasm. There was an increasing trend in Her2/neu expression with the grade

A Study of Aerobic Bacterial Profile and Antimicrobial Susceptibility Pattern of Isolates in Patients with Chronic Osteomyelitis at Tertiary Care Hospital

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INTRODUCTION

Microorganisms are introduced into bone while stabilizing fracture, implanting prosthesis, or due to trauma. Chronic osteomyelitis commonly involves long bones, especially tibia and femur. In chronic osteomyelitis most commonly isolated microorganism is *Staphylococcus aureus*. The aim of this study was to study aerobic bacterial profile and antimicrobial susceptibility pattern of isolates in patients with chronic osteomyelitis.

METHODS

This was a cross-sectional, prospective study, in which 110 samples received during period of 1.5 years were included. Pus was collected by 2 sterile cotton swabs from patients of chronic osteomyelitis. One swab was used for smear of Gram's and Z-N staining and other one for inoculation on nutrient agar, blood agar, and Mac Conkey agar. Plates were incubated at 37° C for 18-24 hours. Antimicrobial susceptibility testing was done by modified Kirby-Bauer's disc diffusion method and results were interpreted by CLSI guidelines.

RESULTS

Out of 110 patients, 81 were male and 29 female. Majority of patients were in age group of 16-45 years. *Staphylococcus aureus* (50%) was the most common isolated microorganism followed by *Pseudomonas aeruginosa* (18%). All Gram-positive organisms were sensitive to Vancomycin and Linezolid. All isolates of *Pseudomonas aeruginosa* were sensitive to Polymyxin B and Colistin. Majority of isolates of Enterobacteriaceae family were sensitive to Meropenem and Levofloxacin and Piperacillin + Tazobactam.

CONCLUSION

Emerging resistant strains pose a challenge to treat osteomyelitis. So, appropriate and judicious use of antibiotics would limit the emergence of resistant strains and help to treat the disease successfully.

A Clinicomycological Study of Dermatophyte Infection Including Antifungal Susceptibility Testing in Patients Attending JLN Medical College and Hospital, Ajmer

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INTRODUCTION

Paradoxically, despite the progress in medicine, dermatophytosis accounts for 3-4% of all dermatological cases with a prevalence estimated around 20%-25% in humans. This study aimed to isolate and identify dermatophytes from tested clinical samples along with determination of their antifungal susceptibility pattern.

METHODS

This study included one hundred patients attending Dermatology and Venereology outpatient department during December 2019 to October 2020. Samples were subjected to mycological examination and antifungal susceptibility was performed by Microbroth dilution testing as per CLSI guidelines (M38-A2) against six antifungals: Amphotericin-B, Fluconazole, Voriconazole, Itraconazole, Terbinafine, and Caspofungin.

RESULTS

Among 100 clinical samples tested, culture positivity was found to be 63% including 76.1% dermatophytes, 19.04% non dermatophytes, and 4.76% non-*candida albicans*. Among dermatophytes, *Trichophyton mentagrophyte* was the predominant isolate (33.3%) followed by *T. rubrum* (29.1%), *T. tonsurans* (14.5%), *T. verrucosum* (8.33%), *T. schoenleinii* (8.33%), and *T. violaceum* (6.25%). Most common clinical type was *Tinea cruris* (53%) followed by *Tinea corporis* (23%). Itraconazole and Voriconazole were found to be most effective against most of the dermatophyte isolates.

CONCLUSION

Emergence of resistant strains demands the need to perform antifungal drug susceptibility tests at least in cases with chronic/recurrent dermatophytosis or treatment failure/relapse as this may guide the clinician while managing recalcitrant/resistant dermatophytosis.

Drug Utilization Study in Type 2 Diabetic Patients attending Diabetic Clinic at a Tertiary Care Hospital

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INTRODUCTION

Drug utilization studies focus on the factors related to the prescribing, dispensing, administering, and effects of drug utilization, beneficial or adverse. It is an important part of pharmaco-epidemiology as it describes the extent, nature, and determinants of drug exposure. The present study was carried out to evaluate the drug utilization pattern of oral anti-diabetic drugs in type 2 diabetic patients.

METHODS

The present study was a prospective cross-sectional study conducted by Department of Pharmacology in association with Department of Endocrinology for a period of six months. Patients above 25 years and either sex with confirmed diagnosis of type 2 diabetes mellitus were included in the study.

RESULTS

In the present study, the common age group affected was 46-60 years. Approximately 62.7% patients were having weight more than normal. The average number of antidiabetic drugs per encounter was 2.85 with range of 1 to 5. The average number of drugs per encounter was 7.29. Metformin was most commonly prescribed antidiabetic drug followed by Glimpiride and majority of patients had taken 3 antidiabetic drug combinations. Metformin + Glimpiride + Teneligliptin combination was most commonly prescribed.

CONCLUSION

This study provided a baseline data regarding the prescribing pattern in diabetic patients that showed the overall prescribing pattern of antidiabetic drugs is rational as per guideline. Incidence of poly-pharmacy was relatively high, but poly-pharmacy is quite relevant in diabetes because diabetes is associated with various concurrent diseases and complications

Plasma Concentration of Pyrazinamide in Patients of Newly Diagnosed Pulmonary Tuberculosis with and without Diabetes Mellitus and Its Correlation with Treatment Response at the End of Anti-Tubercular Therapy at a Tertiary Care Hospital

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INTRODUCTION

The effect of diabetes mellitus (DM) and hemoglobin A1c (HbA1c) values on the plasma concentration of Pyrazinamide remains poorly characterized. The aim of the study was to determine and compare Pyrazinamide 0, 2, 4, and 6 hours plasma concentration in pulmonary TB patients with and without diabetes mellitus (DM) on anti-tuberculosis therapy (ATT).

METHODS

This cross-sectional study was done on 58 newly diagnosed pulmonary TB (PTB) patients with and without DM and on ATT. Sample was collected pre dose (0 hour) and 2, 4, and 6 hours post dose administration in intensive phase. Estimation of Pyrazinamide concentration was done using HPLC. Maximum plasma concentration (C_{max}) and area under the plasma concentration time curve (AUC₀₋₆) were also calculated.

RESULTS

The mean \pm SD of Pyrazinamide C_{max} was 31.34 ± 4.66 and 42.17 ± 8.12 in diabetic TB patients and non-diabetic TB patients, respectively. Time to reach C_{max} was also longer in diabetics (mean T_{max} = 2.5 ± 0.84 minutes) as compared to non-diabetics (mean T_{max} = 2.06 ± 0.36 minutes). Mean AUC₀₋₆ was significantly lower in diabetic (146.50 ± 23.05) than non-diabetic TB patients (197.22 ± 36.71). Pyrazinamide plasma levels and HbA1c showed negative correlation in diabetic TB patients with Pearson correlation coefficient (r) = -0.76, p-value < 0.01.

CONCLUSION

There is a need for individualized dosing of Pyrazinamide based on plasma concentration measurements (therapeutic drug monitoring) in patients of TB with DM.

Stature Estimation from Percutaneous Tibial Length Measurement in Living Subjects in Bikaner Region of Western Rajasthan

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INTRODUCTION

Determination of individuality is a challenging task for forensic medicine experts in partial mutilated or dismembered bodies, especially in cases of natural disasters, railway, and aircraft accidents. The aim of the study was to compare the percutaneous tibial length (PCTL) of right and left tibia in both genders along with a possible correlation between stature of an individual and their PCTL in Bikaner region of western Rajasthan and to derive regression formula and multiplication factor.

METHODS

The study was conducted in the Department of Forensic Medicine and Toxicology among 200 subjects (100 male and 100 female) of age group of 20-35 years. The height and percutaneous tibial length of right and left tibia was measured.

RESULTS

The mean value of height was significantly more in males (174.23 ± 5.11 cm) in comparison to female (156.86 ± 4.07 cm). No significant difference was found between left and right PCTL in both groups. Height and PCTL were found to be very significantly ($p < 0.01$) associated in both male and female groups. The mean value of height and PCTL in total population was 165.55 ± 9.83 cm and 36.98 ± 2.49 cm, respectively. Regarding formulation of regression equation, following equations were found having significant R^2 value and with these equations the predicted stature was almost similar to the observed stature. For male population, $y = 83.39 + 2.34x$ for female population, $y = 74.29 + 2.34x$ and for overall, $y = 30.50 + 3.65x$.

CONCLUSION

Height and PCTL are very significantly associated in both male and female groups in Bikaner region of Rajasthan.

The Study of Ligature Marks in Autopsy Cases of Ajmer Region

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INTRODUCTION

Hanging and ligature strangulation are the two forms of violent mechanical asphyxia in which ligature mark is found. The aim of the study was to find out the incidence of hanging and ligature strangulation and medicolegal analysis of violent asphyxial deaths by compression of neck in relation to their manner of causation viz. accidental/suicidal/homicidal.

METHODS

The study was conducted in the Department of Forensic Medicine and Toxicology for a period of two years. All cases of hanging and ligature strangulation excluding charred and burnt bodies which were reported to the mortuary were included in the study.

RESULTS

Among 200 cases, 192 were of hanging and 8 of ligature strangulation. The commonest age group was 21-30 years. Male: female ratio in hanging was 2.76:1 and in ligature strangulation 1:1. Higher incidence of hanging was observed in Hindu males and in married persons. Domestic unhappiness was the most common precipitating factor for suicide by hanging followed by depression and insanity, drug addiction, unhappy love affairs, poverty, and unemployment. Chundi (44.27%) was the most commonly used ligature material in hanging and cotton rope in ligature strangulation. In 86.45% cases of hanging, apparent length of ligature mark was less than the neck circumference and in ligature strangulation in 62.5% cases. Ligature mark was oblique in 97.39% cases of hanging and 75% cases of ligature strangulation. Atypical (84.8%) and complete (78.1%) type of hanging was predominant to typical (15.10%) and partial (21.8%) type of hanging, respectively. Discontinuity was presents in 98.95% cases of hanging and 50% cases of ligature strangulation.

CONCLUSION

A typical and complete type of hanging was predominant to typical and partial type of hanging.

Prevalence of β -Lactamase Production and Multidrug Resistance among Uropathogenic *Escherichia Coli* at a Tertiary Care Hospital of North Western India

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INTRODUCTION

Inappropriate and widespread use of broad-spectrum antibiotics to treat UTI has resulted in development of multi drug resistant and β -lactamases producing strains which includes extended spectrum β -lactamase (ESBL), Amp C, and carbapenemase producers. The aim of present study was to assess multi-drug resistance and β -lactamase production among uropathogenic *E.coli* isolates.

METHODS

A total of 145 *E. coli* urinary isolates were included. Antimicrobial susceptibility was performed by Kirby-Bauer disk diffusion method. ESBL production was screened and confirmed by phenotypic confirmatory double disc synergy test (PCDDT) method. Isolates resistant to Cefoxitin were considered potential Amp C producers and confirmed by Amp C disc test and modified three dimensions test. Isolates resistant to Imipenem and Meropenem were considered potential carbapenemase producers and confirmed by mCIM test.

RESULTS

Majority of the isolates were obtained from the age group of 21-30 years (48.96%) followed by 31-40 years (14.48%). Highest susceptibility was seen towards Fosfomycin (94.48%), Tigecycline (87.59%), and Nitrofurantoin (77.24%). Highest resistance of 81.38% was observed against Ampicillin while more than 70% resistance was observed with Cefazolin, Cefotaxime, Ciprofloxacin, Levofloxacin, and Amoxiclav. Multi-drug resistance was observed in 85.51% isolates. Among these isolates, frequency of β -lactamase production was ESBL (45.51%), Amp C (28.96%), and caebapenemase (28.96%).

CONCLUSION

Drug resistance due to β -lactamases production is emerging as a serious threat in UTI; routine screening of these β -lactamases will prevent treatment failures.

An Observational Study of Identification of *Candida* Species from Various Clinical Samples and their Antifungal Susceptibility Pattern in SMS Hospital, Jaipur (Rajasthan)

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INTRODUCTION

So far, *Candida albicans* has been the main cause of candidiasis but due to indiscriminate use of azole group of antifungals, infections caused by non albicans *Candida* are also increasing. The increased incidence in *Candida* infections is due to antifungal resistance, phenotypic switching, biofilm formation, adhesins, and toxins secretion. The aim of the present study was to identify *Candida* isolates from various clinical samples and their antifungal susceptibility pattern.

METHODS

A total of 100 samples were included in this study. The isolated organisms were identified by Grams and KOH mount and further processed by Germ tube, Chrom agar, and Corn meal agar methods. Antifungal susceptibility was performed by Kirby-Bauer disk diffusion method.

RESULTS

Out of 100 isolates, 65 were males and 35 were females. Majority of them belonged to 41-50 years age group followed by 51-60 years age group. Out of 100 patients, majority (45) were suffering from urinary tract infections and rest had other infections. 19 isolates were of *Candida albicans* and 81 were those of non albicans *Candida*. Highest susceptibility (83%) was seen towards Amphotericin B. Isolates showed different type of susceptibility towards Voriconazole. Most of the strains of *Candida krusei* (83.3%) were susceptible to it. Maximum resistance was shown for Fluconazole, 47% isolates were resistant to it.

CONCLUSION

There should be awareness among clinicians about *Candida albicans* as well as non albicans *Candida* and judicious use of antifungal agents to overcome resistance.

Drug Utilization Study of Medicines Used in Indoor Patients of Pneumonia in the Paediatrics Department at a Tertiary Care Hospital

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INTRODUCTION

The Paediatric indoor department forms an important platform for conducting drug utilization studies as patients present with a wide range of diseases and the drug use is quite extensive. This study was conducted, laying emphasis on pattern of drug use with cost of drug treatment and determination of the rationality of prescriptions.

METHODS

It was a cross sectional, prospective, purposive, observational, and analytic study conducted at Pediatric indoor department for a period of 12 months. All patients (male and female) who were admitted in unit A and diagnosed as having pneumonia were included in this study after taking consent.

RESULTS

The mean age of patients was 2.69 ± 4.15 years (range 0.1-15 years) with male to female ratio 2:16. The average number of drugs prescribed per inpatient was 7 ± 1.3 . 33% patients were found to be treated with only 1 antibiotic; rest patients were treated by more than one antibiotic where in maximum 67 (55%) patients received 3 antibiotics together. Ceftriaxone was prescribed most frequently. On the suspicion of swine flu, 38.3% patients were given Oseltamivir. All drugs were prescribed by generic name and 65.4% drugs were prescribed from 21st WHO model list of essential medicines (2019).

CONCLUSION

Though the results reflect rational prescribing, there is still scope of improvement in areas of dosage calculation, proper documentation, and prescribing drugs from WHO-EML for children as far as possible.

Histopathological Spectrum of Diseases in the Nephrectomy Specimens: A Three Year Study

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INTRODUCTION

A wide variety of both benign and malignant tumors arise from different components of renal parenchyma, notably tubular epithelium. The aim of the study was to categorize the various types of non-neoplastic and neoplastic conditions of kidney with reference to WHO classification and to determine the age and sex distribution in various renal diseases and association with systemic diseases.

METHODS

This study was performed on 160 cases of nephrectomy specimens over a period of three years from January 2017 to December 2019. Age, sex, type and side of nephrectomy, gross features, and histopathological diagnosis were recorded. Routine histological procedure was followed and slides were stained with hematoxylin and eosin.

RESULTS

Out of 160 nephrectomy specimens, 67 were neoplastic lesion and 93 were non neoplastic in nature. Simple nephrectomy was performed in both non neoplastic and neoplastic lesions while radical nephrectomy was done only in malignant conditions. Overall males were more affected than females. Maximum number of cases were found in the age group 51-60 years. Among non-neoplastic lesions, both inflammatory and cystic diseases were found but most cases were of chronic pyelonephritis followed by xanthogranulomatous pyelonephritis. Among neoplastic lesions, malignant tumors constituted majority of cases. Clear cell renal cell carcinoma (RCC) comprised of maximum number of cases followed by papillary RCC.

CONCLUSION

Non-neoplastic renal diseases are most common cause of nephrectomy in both adults and children.