A study on epidemiology, etiology, risk factor and treatment management in chronic kidney disease on children, adult and geriatric patients in a tertiary care teaching hospital: A systematic mini-review

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ABSTRACT

Chronic kidney disease (CKD) was recognized as universal health problem for population. It can result in a systemic review of epidemiology, etiology, risk factors, and treatment management was reporting the incidence of CKD about children, adult, and geriatric patients by using the research articles from 1982 to 2020. The object of study to find out a incidence about epidemiology, etiology, risk factor, and treatment management for all age groups with CKD patients in review articles. The discussion in this study systemic mini-review was about CKD in children, adult, and geriatric patients. In 2012, 2018 and 2019 epidemiology is mostly geriatrics are effected with CKD compared with children and adults but in 2016 children and geriatrics are equally effected with CKD. In 2017 to 2019 etiology is mostly geriatrics are effected with CKD when compared with children and adults. From 2000 to 2010 and 2011 to 2020 risk factors are mostly children’s are effected with CKD having risk factors to compare with adults and geriatrics. The treatment management from 1982 to 2020 the medications are intervented like radioactive iodine, Azathiprine, methotrexate, lisinopril, hemodialysis, methotrexate, and lisinopril for all age groups of CKD patients. The study was concluded that patients with CKD has increased the epidemiology, etiology, risk factor, and treatment management on children, adult, and geriatric patients with CKD. Future research should investigate adequate information about children, adults, and geriatric patients with CKD for better outcomes in further study.

INTRODUCTION

Chronic renal disease was a life threatening condition in a world. This condition became an intensive clinical and epidemiological research from the past decade. Belonging to the past the chronic kidney disease research literature created a definition of CKD. The current international guidelines are define a Chronic kidney disease by condition has to decrease renal function while observe a GFR.

Most of lifelong renal incidence peoples have been dead for some health related issues. Who are the people are with cancer incidence and diabetic, renal
function worsens and cardiovascular disease etc., this incidence of peoples are increasing the death rate in chronic kidney conditions. To decrease a death rate the people has to follow a correct diet and a proper excise. People when they are progress to final stage chronic renal condition was having five to ten times to die an initially. Providing some programmes is support or make a positive difference for CKD patients or normal peoples by educational or life style modifications. (Webster et al., 2017)

The significant cause of CKD has become a morbidity and mortality on developing countries. Before showing clinical symptoms the CKD patients commonly experience a long asymptomatic phase. The specific diagnosis in kidney disease includes progression of renal failure, complications leads to decreased kidney function and development in cardiovascular disease. Mostly the treatment can prevent the end stage of chronic kidney disease by early detection of renal condition.

Epidemiology in kidney disease improving a global outcome guidelines it was contributed to initial screening different stages of kidney problem. Some studies are recently were mentioned the overestimated about a particular population that affects a chronic renal problem between 8% and 13% from different parts of the world. Those young and older age groups are having high or low CKD prevalence. (Delaney et al., 2017) In past decades the hypertension patients caused by end stage kidney failure. All incident patients having 44% are diabetes while glomerulonephritis and cystic kidney disease. (Atkins, 2005) A part of incidence are end stage renal failure due to diabetes are reflected in 25% of Australia and 15% to 33% European. It is a non-communicable disease that affects the world especially India. Because of the absence of a registry in India, the true magnitude of end-stage renal disease is unknown (Singh et al., 2013).

India recently estimated 229 per million and more than 100,000 population are infected with kidney problems. Mostly this disorder has occurred an age-adjusted incidence rate of ESRD. The major problem for a population is about the economy it leads to becoming an end stage of kidney disease and healthcare in the future years, But 10% final stage of kidney disease patients an India have receiving renal replacement therapy. To know the awareness and detecting the advanced stage in kidney problems. (Greenberg et al., 2014) CKD is commonly occurring in all age groups. In 2019 CKD in peoples are having (38%) aged as 65 years than in a people of aged as 45-64 years (13%) or 18-44 years (7%). Mostly are geriatrics has effected than the children’s and adults (Riyami et al., 2019).

Etiology are life long renal disease may cause Diabetic nephropathy, hypertensive nephrosclerosis, chronic interstitial nephritis, glomerulonephritis, obstructive uropathy, and genetic mediated (Gadam et al., 2016). The incidence of CKD like 30-40% ephrophy, 20% Hypertension Nephropathies, 15% Glomerulonephritis, 10% Polycystic renal disease, and Tubulointerstitial nephritis. Congenital obstructive urinary flow, chronic recurrent nephrolithiasis and amyloidosis these disorders are permanently damage kidneys. It leads to chronic renal failure. (Ali et al., 2019)

Pathogenesis of chronic kidney diseases

Many causes of CKD are hypertension, diabetes, Glomerulonephritis, and urinary tract obstructions (http://www.pathophys.org/ckd/). The pathogenesis of chronic kidney diseases was shown in Figure 1. Mostly the risk factors were increases for geriatric peoples. It occurs for African-Americans, Native Americans, and Asian-Americans when compared to other country and other risk factors such as family history, kidney infection, vacuities, kidney stones, kidney cancer, bladder cancer, systemic lupus erythematosus, scleroderma, increasing age, diabetes, hypertension, and cigarette smoking these all leads a chronic renal disease. This renal disease was diagnosed by using urine test blood test and ultrasound or renal biopsy. The urine test was to measure albumin levels. The blood test was measured a estimated glomerular filtration rate, it will help to estimate a renal condition. For particular underlying causes there preferred a ultrasound or renal biopsy. (Kazancioglu, 2013)

The chronic renal disease having the symptoms like poor appetite, decrease the weight, swollen a ankle, feet and hands it may lead an water retention(edema), difficulty in breathing, tiredness, blood have been form in urine it may cause as insomnia and skin itchy. (Turner et al., 2012).

Treatment

1. Medications to control blood pressure
2. Decrease cholesterol level by medication
3. Medications for treat anemia
4. Relieve swelling related medication
5. Protect the bones by using medication
6. Kidney dialysis for treating people with kidney problem
7. Renal transplant (Gibson et al., 1982).
METHODS

Eligibility criteria
We included a systematic mini-review that reported the children, adults, and geriatrics are certain percentages that were affected with CKD are reviewed by research articles. What has the age group of peoples has affected with chronic kidney disease patients some particular incidence of risk, etiology, epidemiology, and treatment management was taken as eligibility criteria while most of the studies are established the diagnosis about chronic renal disease. In this study are reported by measure estimated glomerular filtration rate while obtaining from laboratory data.

Selection process
According to the systemic review article first independently reviewed all research articles to get an idea about incidence in CKD patients. After reviewed the articles were included the percentage of epidemiology, risk, and etiology in CKD patients and drugs are using for treatment in CKD patients. And finally, the review article is prepared it sends to the guide to rectify the mistakes by applying the plagiarism in my mini-review article.
Table 1: Systematically review about 12 studies are reporting the patient epidemiology characteristic (groups wise distribution) with CKD patients

| Study                                      | Year | Groups     | Epidemiology (%) |
|--------------------------------------------|------|------------|-------------------|
| (Kari, 2012)                               |      | Children   | 16.8%             |
| Journal: PMC, NCBI                          |      |            |                   |
| (Matsushita et al, 2013)                   | 2012 | Adult      | 10 to 16%         |
| Journal: International journal of epidemiology |      |            |                   |
| (Riyami et al, 2019)                       |      | Geriatric  | 74%               |
| Journal: Kidney international report       |      |            |                   |
| (Chukwuonye et al, 2019)                   | 2019 | Adult      | 7.5%              |
| Journal: International journal of nephrology |      |            |                   |
| (Rai et al, 2019)                          |      | Geriatric  | 42.6%             |
| Journal: Saudi journal of kidney disease and transplantation |      |            |                   |

Table 2: Systematic review of 9 studies reporting patient etiology characteristic (groups wise distribution) with CKD patients

| Study                                      | Year             | Group       | Causes                                      | Etiology(%) |
|--------------------------------------------|------------------|-------------|---------------------------------------------|-------------|
| (Mortazavi and Rafiee, 2010)               |                  | Children    | Focal segmental glomerulosclerosis          | 13.9%       |
| Study design: retrospectively              |                  |             |                                             |             |
| Journal: science alert                     |                  |             |                                             |             |
| (Sharma et al, 2018)                      | 1999 to 2010     | Adult       | Diabetes mellitus, Chronic glomerulonephritis and Hypertension | 3.79%       |
| Study design: Retrospective cohort study   |                  |             |                                             |             |
| Journal: Saudi Journal Kidney Dis Transpl  |                  |             |                                             |             |
| (Pham and Ziegert, 2016)                  |                  | Geriatric   | diabetes mellitus                          | 6%          |
| Study design: a phenomenographic study     |                  |             |                                             |             |
| Journal: an international journal          |                  |             |                                             |             |
| (Ali et al, 2019)                         |                  | Children    | Secondary reflux nephropathy and glomerulopathy | 73.3%       |
| Study design: Descriptive study Journal:   |                  |             |                                             |             |
| Journal of Current Microbiology and Applied Sciences |      |             |                                             |             |
| (Tuttle et al, 2019)                      | 2017 to 2019     | Adult       | Diabetes, hypertension, or prediabetes     | 23.1%       |
| Study design: A cohort study.              |                  |             |                                             |             |
| Journal: Jama network                      |                  |             |                                             |             |
| (Cockwell and Fisher, 2020)               |                  | Geriatric   | Cardiovascular disease and gout             | 95%         |
| Study design: global burden of disease     |                  |             |                                             |             |
| Journal: The lancet                       |                  |             |                                             |             |
Table 3: Systematic review of 6 studies reporting patient risk factor characteristic (groups wise distribution) with CKD patients

| Study (primary author and year) | Group of patients | Risk factor | Risk (%) |
|--------------------------------|------------------|------------|----------|
| (Staples et al., 2010)         | Children         | Congenital Inherited kidney disorder | 60%-70% |
| (Shardlow et al., 2016)        | Adults           | Cardiovascular risk | 8-16% |
| (Shardlow et al., 2016)        | Geriatric        | Cardiovascular risk | 50%     |
| (Tuttle et al., 2019)          | Children         | Diabetes, hypertension | 52.8% |
| (Duan et al., 2019)            | Adults           | Diabetes | 35.5% |
| (Mallappallil et al., 2014)    | Geriatric        | Cardiovascular disease | 39.4% |

Table 4: Systematic review of 6 studies reporting patient treatment management characteristic (groups wise distribution) with CKD patients

| Study (primary author and year) | Group of patients | Treatment | Outcomes |
|--------------------------------|------------------|-----------|----------|
| (Gibson et al., 1982)          | 59 gout patients with chronic kidney problem | Colchicine and allopurinol versus colchicine or Rasburicase versus placebo | In 2 years the drugs are declined the renal function |
| (Malaguarnera et al., 2009)    | 38 elderly patients having high-level uric acid | ACEIs/ARBs Febuxostat or placebo | The treatment was resulted in that increase a creatinine clearance over at 2 months and decrease creatinine levels |
| (Blydt-Hansen et al., 2014)    | >50% of Children's with glomerular disease | ACEIs/ARBs | Controls the blood pressure. |
| (Sircar et al., 2015)          | 93 patients are with hyperuricemic it leads a CKD 3 and 4 stages | Febuxostat or placebo | Febuxostat was a slowly estimated glomerular filtration rate in a stages 3 and 4 than a placebo |
| (Ferrey et al., 2020)          | 56 year old man is in end-stage in CKD by the attacking of covid-19 and cardiac disease | Hemodialysis Chloroquine hydroxychloroquine | Hemodialysis is a protective intervention for face of such pandemic infections. |
Figure 4: Risk factor characteristic

Data analysis
The data was collected from research review articles that data was analyzed by using kappa statistic models. The data about epidemiology, etiology, risk factors, and treatment management was analyzed by using figures. The data was selected as a percentage from research articles. The data were shown as pie diagrams and histograms.

RESULTS AND DISCUSSION
The results were referred by the research articles and journal using electronic device. This study search was started at March 2020 resulted in 6281 articles. After referred the data it was shown by using flow diagrams to detailed a literature search in a study. According this study was inclusion the 33 research articles were included in this results and discussion. To systemic mini-review estimated the percentage of each category about CKD patients by reviewing research articles.

According to the results and discussion in a mini systemic review about chronic kidney disease (CKD) patients as per age groups was estimated the epidemiology, etiology, risk factors, and treatment management with the help of research review articles. The part of epidemiology or World Wide was reported by reviewing the research articles about chronic kidney disease patients are mostly geriatrics are affected when compared to adults and children's in the duration of 2012 to 2019 are reported in Table 1. The epidemiology are shown in Figure 2.

The etiology characteristic was estimated by the research article from 1999 to 2019 of all age groups of peoples are effected with CKD with different causes like focal segmental glomerulosclerosis, chronic glomerulonephritis, cardiovascular disease, and gout, etc. are presented in Table 2. The etiology report was shown in Figure 3. While referring a research article from 2000 to 2020 the children are most affected by different risk factors like diabetes, high blood pressure, congenital and inherited kidney disease, etc. When compared to adults and geriatrics it was reported in Table 3. The risk factor was shown in Figure 4. Who are the peoples (children’s, adults, and geriatrics) are facing with CKD in the year 1982 to 2020 the preferred the medications like Colchicine and allopurinol versus colchicines, Rasburicase versus placebo, IgA nephropathy ACEIs/ARBs, Febuxostat versus hemodialysis, Azathioprine, methotrexate and lisinopril and in some conditions there choose kidney transplantation. For treatment management in children, adult, and geriatric patients with CKD. The treatment management was shown in Table 4.

CONCLUSIONS
To review all research articles about World Wide occurrences with CKD and some risk factors are causes the CKD. There preferring treatment management for children, adults, and geriatric patients with CKD. According to the results as per mini-review, all age groups of peoples is an effect has chronic renal disease but mostly the geriatrics are facing kidney diseases. This result is estimated by research review articles from 1982 to February 2020.

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Conflict of interest
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