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RESEARCH ARTICLE

OBSTRUCTIVE UROPATHY AND ITS TREATMENT

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Abstract

Background: Obstructive uropathy is a major clinical problem defined as the presence of any functional or structural abnormality of the urinary tract that leads to blockage or reduction of urine flow. It accounts for almost 10 % of cases of renal failure.

Objective: The purpose of this review article is to evaluate the different Obstructive Uropathy treatment options that could be offered for patients suffering from this condition.

Methodology: A medical literature search using Pubmed/Medline that addressed both the pathophysiology and treatment of obstructive uropathy was performed.

Conclusion: Various causes are claimed for the occurrence of obstructive uropathy. Once presence of obstruction is confirmed, intervention is warranted. The type of intervention depends on the location of the obstruction, its degree, and its cause, as well as the presence or absence of concomitant diseases and complications, and the general condition of the patient.

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Introduction:-

Obstructive uropathy can be defined as any blockage of urine drainage from the kidney (renal calyces or renal pelvis), ureter, or bladder. As a result of the blockage, urine backs up into the kidneys, causing dilatation of the ureter, renal pelvis, and renal calyces, which can damage the kidney if it is not treated. The appearance of dilated or enlarged renal pelvis and calyces is referred to as hydronephrosis and is a symptom of obstructive uropathy. Obstructive uropathy can be a long-term disease (chronic) or occur suddenly (acute). As well, it can occur in one kidney (unilateral) or both kidneys (bilateral). Symptoms may include nausea, vomiting, excessive sweating (diaphoresis), and abdominal or groin pain. Obstructive nephropathy is of great importance to clinicians since it is a common entity that is treatable and regularly reversible. Patients with obstructive nephropathy might be asymptomatic or might show differing qualities of clinical disorders. Obstructive uropathy alludes to the vicinity of auxiliary or utilitarian changes in the urinary tract that hinder the ordinary stream of pee. Obstructive nephropathy is the renal malady brought on by impeded stream of pee or tubular liquid. Hydronephrosis signifies expansion of the urinary tract (1).

The occurrence of hydronephrosis reported by Bell (2) in a progression of 32,360 dissections was 3.8% (3.9% in guys, 3.6% in females). The rate of clinical signs of obstructive uropathy preceding demise was not reported, and it is likely that hydronephrosis was an accidental finding in a significant number of these patients. The rate of hydronephrosis at examination is to some degree lower in kids than in grown-ups, being 2% in one arrangement of 16, 100 post-mortems (3). More than 80% of youngsters with hydronephrosis at post-mortem examination were

under 1 year old, with the parity of youth cases being conveyed consistently through the adolescence years. Around 166 patients for every 100,000 populace had a hypothetical conclusion of obstructive uropathy on admission to healing centers in the United States in 1985 (4). Among male patients with kidney and urologic issue, obstructive uropathy positioned fourth at release (242 patients/100,000 releases). In females with kidney and urologic issue, obstructive uropathy positioned 6th as a determination at release (94 patients/100,000 releases). In the United States in 1985, around 387 visits for each 100,000 populace were identified with obstructive uropathy (5). New ultrasound methods have made conceivable the finding of obstructive uropathy in the baby amid pregnancy (6). In the grown-up, the occurrence and reasons for urinary tract obstruction fluctuate with the age and sex of the patient. In youthful and moderately aged guys, intense obstruction from renal calculi is common but provisional, and such cases would not be incorporated into post-mortem examination studies. In females of this age bunch, then again, pelvic disease is a vital reason for obstructive uropathy. In the more seasoned age bunch, urinary tract obstruction is more common in the anatomic or practical components are important in building up the reason for the obstruction. The level at which the obstruction happens in the urinary tract, and whether it is intraluminal, intramural (natural), or extramural (outward) are useful. The vital levels of obstruction in the urinary tract are the urethra and the bladder neck, the bladder and the ureterovesical intersection, the ureter, and the renal pelvis and ureteropelvic intersection. Obstructive uropathy is arranged by degree, term, and site of the obstruction. The degrees of obstruction are said to be high review when it is finished, and poor quality when partial or incomplete. When the obstruction is of brief term it is said to be intense. Most often this is because of stones. Obstruction that grows gradually and is durable is said to be unending, as in intrinsic ureterovesical variations from the norm and retroperitoneal fibrosis. Obstructive uropathy is because of useful or anatomic sores that can be found anywhere in the urinary tract from the renal tubules (gems) to the urethral meatus. Obstructive uropathy influencing the lumen of the renal tubules is said to be intrarenal, and those reasons for obstruction that emerge in the urinary tract are alluded to as extrarenal. Extrarenal obstruction thus is partitioned into upper urinary tract obstruction (over the ureterovesical intersection), which is normally one-sided in nature, and lower urinary tract obstruction, which by definition is respective. The causes of upper urinary tract obstruction can be characteristic or extraneous. Inborn causes are either intraluminal or intramural, with renal calculi being the fundamental driver of intraluminal obstruction. The intramural reasons for obstruction are either anatomic or useful. Anatomic lesions of the upper urinary tract, a less common cause of obstruction, incorporate ureteral strictures, considerate or malignant tumors of the renal pelvis and ureter, ureteral valves and polyps. The utilitarian issue incorporate vesicoureteral reflux and adynamic ureteral sections. The most common site of useful obstruction in the ureters is an utilitarian defect at the ureteropelvic junction. This is usually a disease of infants. The second most common cause is a functional defect at the ureterovesical junction.

Therapy for obstructive uropathy is largely determined by whether the obstruction involves one or both kidneys, and by the age of the patient. In the infant and child, obstructive uropathy is almost always due to a congenital malformation of the ureter, bladder, or urethra. Ultrasonographic prenatal diagnosis has permitted early detection and even fetal intervention for posterior urethral valves, although this form of treatment must be considered experimental at present. More important to the affected infant than optimal renal development is the prevention of pulmonary hypoplasia, which is a consequence of fetal oliguria and oligohydramnios. Removal of the stone can be accomplished surgically or by lithotripsy. Bladder outlet obstruction is usually secondary to prostatic hyperplasia, which may progress slowly, allowing a delay in surgical intervention. Neurogenic bladder may require intermittent catheterization or cholinergic therapy; those with hypertonic bladder may benefit from anticholinergics. Regardless of the patient's age, prompt and accurate diagnosis is essential to planning an optimal strategy for the management of obstructive uropathy (7).

Objectives:-

This study was undertaken to discuss the **Obstructive Uropathy and its treatment** with least rate of recurrence. And to highlight the most incidence causes of **Obstructive Uropathy** to educate patients who are going under surgical procedure about the condition that may cause more complication results than the condition was operated for, and also to evaluate the different **Obstructive Uropathy treatment** techniques that could be suitable for most of patients suffering from this condition.

Methodology:-

Medline (pubmed) literature review and analysis for previous studies that are discussing Obstructive Uropathy and its different management procedures for, which become a common nowadays, our search was by using the search terms 'Obstructive Uropathy and its Treatment' and 'management of uropathy' alone and in combination. Publications were selected mostly in the past 30 years, but did not exclude commonly reference and highly regarded

older publications. The reference list of articles was also searched, identified by the search strategy and those selected that were relevant. Selected review articles and meta-analyses were included because they provide comprehensive overviews that may be beyond the scope of this article.

Results:-

Here we would like to discuss different therapeutics aspects of Obstructive uropathy, in study that was performed by Gunter Wolf et al. in 2005 administration of an ACEinhibitor or an angiotensin II receptor (ATI) antagonist, to rats with unilateral ureteral obstruction, ameliorated the increase in interstitial volume and attenuated the increased expression of TGF- β 1 in tubular cells, the increased production of extracellular matrix protein, the activation of NF- κ B, the proliferation of fibroblasts and the conversion of their phenotype to myofibroblasts. A monocyte/macrophage infiltrate was present in the obstructed kidney of untreated rats and in the obstructed kidney of rats treated with the angiotensin II receptor antagonist. By contrast, this infiltrate was markedly decreased in the obstructed kidney of rats treated with an ACEinhibitor. This difference may be owing to greater generation of nitric oxide related to increased levels of bradykinin during ACE inhibition. In fact, rats with unilateral obstruction given both an ACEinhibitor and (LNAME)(an inhibitor of NO formation) had a substantial macrophage infiltrate. Administration of L-arginine in the drinking water significantly blunted the increases in interstitial volume, monocyte infiltration, interstitial collagen IV and smooth muscle actin expression (8).

There was a study by IoannisVakalopoulos et al. 2012 which discussed the Frontometaphyseal dysplasia is a rare genetic syndrome characterized by skeletal dysplasia comprising hyperostosis of the skull and modeling anomalies of tubular bones. The most common manifestations include supraorbital hyperostosis, hypertelorism, down-slanting palpebral fissures, and generalized skeletal dysplasia. The dysplasia manifests with thickening of the calvarium; agenesis of the frontal, ethmoidal, and sphenoidal sinuses; and bowing and undermodeling of tubular bone diaphyses and metaphyses, but the study indicates that obstructive lesions of the ureters and urethra commonly accompany frontometaphyseal dysplasia and should be specifically sought and excluded in individuals for whom the diagnosis is being considered. Our case represents a guide to how patients suffering from this rare syndrome may be approached to assess and correct functional and anatomical anomalies (9).

Surgical management and follow-up:-

Emergency treatment of obstructive uropathy is needed in the presence of bilateral obstruction, urosepsis, uremia and hyperkalemia, persistent renal colic, worsening of hydronephrosis and renal impairment.

Regarding the dilemma to insert a ureteral stent (JJ stent) or a percutaneous nephrostomy, literature indicates especially Docimo SG et al. 1989 that both procedures do not show any statistically significant difference in terms of efficacy. However, in some hospitals, percutaneous nephrostomy is placed only by the interventional radiologists that may not be available in an emergency basis. In patients that receive anti-coagulation medication, the preferred therapy is JJ stent placement whereas in the case of urosepsis, percutaneous nephrostomy placement is the gold standard therapy. In obstructive uropathy due to cancer, there may be difficulties during the insertion of a JJ stent. After the management of the obstruction, polyuria may happen, especially in cases of bilateral obstruction or obstruction in a solitary kidney. Polyuria is due to a significant decrease in the receptor transport and because of reduced sodium reabsorption from the descending limb of the Henle loop. Usually, polyuria resolves when fluid and electrolyte homeostasis is achieved. Monitoring the level of consciousness and the vital signs, electrolyte supplementation and a gradual reduction of the administered intravenous fluids are essential (11).

Discussion:-

A prospective study by Khalaf IM et al 2004 included 91 consecutive adult patients with the diagnosis of unilateral obstructive uropathy and a normal contralateral kidney. All patients had a nonequivocal cause of obstruction that was successfully relieved after treatment. All patients underwent plain abdominal x-ray, gray-scale ultrasonography, Doppler ultrasonography, excretory urography, and technetium-99m-diethylenetriamine pentaacetic acid radioisotope renography before and after treatment. Patients were seen regularly at 3, 6, and 12 months for a mean duration of 13 +/- 6 months (range 6 to 36). At each visit, ultrasonography and renography were performed, and excretory urography was performed at least once during follow-up. The study showed that On univariate analysis, the factors that significantly affected the recoverability of renal function after the relief of obstruction included preoperative renographic GFR, renal perfusion, parenchymal thickness, parenchymal echogenicity, corticomedullary differentiation, reduction of the renal resistive index of the corresponding kidney, and compensatory hypertrophy of

the contralateral normal kidney. However, using multivariate analysis, only the preoperative selective renographic GFR and renal perfusion of the corresponding kidney sustained their statistical significance as independent factors affecting renal functional recovery. A preoperative GFR value of 10 mL/min/1.73 m² was estimated as the cutoff point that can determine the best prediction of stabilization or improvement of renal function after the relief of obstruction(10).

Conclusion:-

The absolute most regular reason for obstructive uropathy as far as we can tell is ureteral pressure because of a gravid uterus. Decision treatment much of the time is moderate treatment. At the point when regardless of moderate treatment signs and indications persevere; urinary by-go with anti-infection prophylaxis must be performed. Ureterorenoscopy as an indicative and helpful methodology ought to be thought about in pregnant ladies with ureteral lithiasis. Frequency of pre-term work was not higher than normal.

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