Renal Failure in Pelvic Organ Prolapse

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Pelvic organ prolapse (POP) is the aberrant herniation or descent of the pelvic units from their regular sites or their normal location in the pelvis. The pelvic organs that may be interested include the vaginal apex or uterus, anterior wall of vagina-cystocele, or posterior wall of vagina-rectocele. A thorough review of the literature using PUB med and SCOPUS databases was conducted We focused on those patients with preoperatory renal failure and on the results that these patients have achieved after surgery regarding this rare complication of pelvic prolapse. Pelvic organ prolapse can be considered an underdiagnosed disease. Many patients fail to present themselves to a doctor due to a false shame feeling. Fortunately renal failure is a rare complication of pelvic organ prolapse, often occurring in patients with asymptomatic or neglected POP. A major proportion of cases are able to recover some of their renal function but for some dialysis remains the only option

Keywords: pelvic organ prolapse, ureterohydronephrosis, renal failure

Pelvic organ prolapse is a relative frequent pathology with a prevalence varying from about 14% in the general population to almost 68% in the elderly causing a serious health problem [1-4]. The association between organ prolapse and renal impairment was first described in 1824 and reviewed in 1931 by Frank [5]. Also, Fiorep was the first to describe the association between hydronephrosis and POP.

Pelvic organ prolapses (POP) is usually associated with minor or major urologic problems, directly related to the stage of the prolapse. These may include urinary tract infections, urinary incontinence, hydronephrosis and kidney dysfunction. It also could cause chronic renal failure (CRF), acute renal failure (ARF) and end stage renal disease (ESRD) [6-11].

There are sometimes cases in which hydronephrosis is reduced by a mere surgical maneuver like pushing the prolapsed uterus back in the abdominal cavity, but this is very rare. Usually the presentation is more common like urinary tract infection or due to renal failure symptoms. Unless total uterine prolapse is timely responded, acute renal failure, which is developed due to ureter-ohydronephrosis, might turn into chronic renal failure.

Unfortunately, more than 50% of these patients will not report to the doctor. Most of the time they are diagnosed due to associated pathology. The causes are multiple: vaginal births, age, strong physical effort, collagen diseases, menopause, pelvic surgery, radiotherapy, obesity,metabolic syndrome, habitual constipation [12-19].

The renal dysfunction is globally related to the degree of pelvic prolapse, and its consequences ranges from acute to chronic renal failure and may also lead to end stage renal failure. In elder patients and in patients with recurrent infections of the urinary tract a gynaecologic evaluation is a must considering the possibility of some sort of organ prolapse. It is also very important to exclude any other gynaecological conditions like neoplasia, leyomiomas, urethral ectropion endometriosis and mullerianosis of the bladder.

The symptoms vary from stress incontinence, increased urinary frequency, urinary incontinence, pain during sexual intercourse, and increased susceptibility to urinary tract infection. The degree of prolapse does not corroborate with the symptoms. There are many cases with little or no symptoms which present grade III or IV of prolapse. Likewise, there are patients with grade I or II with severe symptoms.

Pathology of renal impairment in patients with POP

There are many hypotheses for causes of renal impairment in POP and all of them are related to miscellaneous mechanisms. The compression or entrapment of the ureters between the pelvic bones, levator ani muscle, bowels and uterine fundus can be one of the causes [17]. Another one may be that the cardinal ligaments of the uterus or the uterine arteries compress the ureters. Also, the process of ureter elongation itself can be a cause of obstruction. If the trigone and the bladder neck is engaged the ureters may also be elongated and compressed [20,21]. Another possible cause is that the bladder itself may be obstructed due to it prolapse.

The real mechanism seems to be as it follows bladder is pushed downward by uterus compression, intra-ureteral pressure is increased due to tension, positional changes occur, lumen becomes narrow because of mucosal oedema, and partial or total obstructions may develop.

In which degree the renal function is altered depends mostly of the period of obstruction. Also, the severity of the obstruction is another factor. Sometimes it is better to be a higher degree of obstruction, in this case the pain forces the patient to see a doctor who can diagnose the disease in an earlier stage. Chronic urinary obstruction on the other hand is very insidious and symptoms are scarce. Tissue changes in chronic renal obstruction are in most cases irreversible. Prompt urinary drainage in acute urinary obstruction allows full recovery of renal function which is not the case in chronic renal obstruction.

These patients will present with important changes of the hydro-electrolytic balance, secondary to the impairment of the sodium, potassium and protons tubular excretion and resorbtion process. sometimes leading to a bleak prognosis like arrhythmias and even exitus [22-25].

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The alteration of the glomerular filtration and of the tubular function also affects the urine concentration and the dilution processes. In time due to the chronic elevated pressure in the kidneys, the renal papillae will be compressed, and the renal parenchyma will be lost. Other changes that occur in such cases are tubular dilatation with epithelial cells flattening atrophy, peritubular collagen deposition, fibrotic changes and arteriolosclerosis. If the obstruction goes undetected the patients will develop chronic renal failure secondary to the loss of nephrons, as well as to tubular atrophy and to interstitial fibrosis.

There are still many questions regarding the period of time in which the renal function becomes irretrievable. There is general consensus that, after two or three weeks, renal function is still recoverable but after more than three months the lesions are permanent [26].

Investigations start with a simple ultrasound and become more and more complex and invasive [27,28]. Pyelography, computer tomography, even magnetic resonance can be used for this pathology. In the end, still the clinical examination remains the cornerstone of diagnosis. One should always take into account that renal insufficiency does not fare well with contrast substances so there is one major limitation for these investigations.

There are not many articles regarding this relatively rare pathology, most of them treating uretero-hydronephrosis and not focusing on renal failure. Most of them are case presentations. To our knowledge this is the first review of this pathology.

Prompt decompression of urinary system is the first step in preserving renal function. One could argue that nephrostomy even though it is a rather invasive and uncomfortable solution it aquires faster normal renal function than bilateral double *J* stenting. Urinary catheter is mandatory given the fact that no obstacle should be present. There is a lot of talk regarding the use of urinary catheterisation but still the benefits are far more appealing. Without any doubt the definitive solution resides in the removal of the cause.

Saad Benkirane et al in their case report from 2014 present a 65 years woman with no urinary incontinence but a grade IV prolapses and subsequent urinary tract infection. After hysterectomy and plication of the bladder the uretero-hydronephrosis decreased and renal function returned to normal. This is a fortunate case in which renal function was able to recover [29].

On the other hand, Naser Sabah Hussein et al. presented the case of a 62 years old woman with important comorbidities which was known with a degree of POP for more than three years. She presented with acute symptoms of pyelonephritis. Local exam revealed a grade III prolapses combined with cystocele and rectocele. Imagistics showed important bilateral uretero-hydronephrosis. Double J stenting and antibiotics stabilized the patient. Unfortunately, after 4 months her renal function did not improve, and she was referred to dialysis. The mechanics behind this renal failure was the compression of the ureters between the uterus and the bladder [30].

Birge et all stress the importance of multiple birth as one of the causes of POP by presenting the case of a 69 years old woman with eight vaginal births and with grade IV POP for about two years. Ultrasonography revealed important uretero-hydronephrosis, serum creatinine was 4.2 mg/dL and Escherichia Coli urinary infection was present. Although this case was very impressive after surgery the patient recovered her renal function without any loss.

Yanik et al in an older article present the case of a 25 years old woman with a degree of mental retard and grade IV POP. What was unusual for this patient was the very young age for such a disease. Significant uretero-hydronephrosis and renal impairment was present. The authors explained the presence of grade IV POP by the kyphosis of this patient. No other associated factors were found. After surgery the patient partially recovered her renal function.

Ai Miyagi et all presented the case of a 66 years old woman grade III hydronephrosis and grade IV POP in which prompt treatment managed to recover a degree of the renal function, but the patient retained renal failure. Treatment in her case due to severe comorbidities was the use of pessary, a useful but not complications free device.

Chitale et al present two cases one of a 73 years old and the other one 86 years old women presenting with advanced degree POP in which surgery/pesary proved to be a saviour solution, both patients recovering their renal function after a few weeks.

There are cases when simple ureteral stenting is not enough given the advanced degree of uterine prolapse. Matsuo et al presented the case of an 80 years old woman with POP grade IV, with a life threatening condition at presentation. Ureteral stenting and pessary were the viable surgical solution in her case.

Moslemi et al. described two cases of women in their 8th decade with severe POP and renal impairment failure. One patient received initially bilateral nephrostomy and then vaginal pessary, while the other patient was surgically man-aged with Burch colpo-suspension and temporary double J stent. Renal function was recovered [31].

Bae et al. presented the case of a 74 years old fe-male complaining of general weakness and anorexia for twenty days. Later blood samples revealed a creat-inine of 12.35 mg/dl and hydronephrosis induced by her uterine prolapse. Despite catheterization and haemodialysis, renal function was never recovered, and the patient remained in end stage renal disease [32].

Leanza et al reports a 3,3% percentage of renal failure in their study on 234 patients. Wee et al reports 4 cases out of 121 who, despite surgery evolved to end stage renal disease [33,34].

A Swedish study presented the prevalence of any degree of prolapse in women aged 20 - 59 years was 30%. In this observational study, the stage-wise distribution of POP was as follows: stage 0-6%; stage I - 43%; stage II - 48%; stage III - 3%. On the other hand, in women aged 18 - 82 years old the prevalence of major uterine prolapse accounts approximately 50.3% 13 In this situation, acute renal failure appeared secondary to obstructive uropathy, but in the most cases the hydronephrosis was usually asymptomatic. It was observed that with correct surgical and medical treatment, the acute renal failure secondary to prolapse resolves [35,36].

Gynaecological examination is mandatory in elderly patients, given the fact that renal failure is a very insidious disease which left untreated can lead to dialysis and even renal transplant. Unfortunately, there are not many countries in which general practitioners use to do this. There some experiments in this way, for instance in a little town in Norway general practitioners performed a gynaecological examination, a pad test and a stress provocation test and discovered a staggering 38% of women with severe genital prolapses [37]. Still this article dates back from 1996 and nothing has been done to improve this situation. On the other hand, in the Netherlands only 2% of those who use pessaries were first referred to a general practitioner the

rest being referred to a gynaecologist [38]. This highlights not only the variable role of a general practitioner depending on the country but also *the false shame* that makes the patient reluctant to speak to a medical professional. Often these patients develop anxiety, shame, low self-esteem, depression and fear of rejection, therefore developing the tendency of self-isolation and neglecting their health problems, which makes them prone to rare diseases like the one we spoked.

Also, medical education, even the basics is a must in order to be able to recognize at least that there is a problem which should be treated seriously. There are many cases in which patients with recurrent urinary infections would rather treat themselves "empirically" than going to see a doctor. Recent experimental studies on mice and rabbits demonstrated the nephrotoxicity of many substances [39-41].

Conclusions

Science and technology progress and new treatment is readily available. The life expectancy is increasing but, in the meantime, families are not interested in giving birth to many children unlike it used to be, before so we expect more patients with this kind of pathology. Renal failure is a rare complication of POP. Usually surgery in all its variety is the main solution but for some patients with severe comorbidities pessary is the optimal choice. As mentioned earlier, this is not a complication-free device: vaginal bleeding, infection, ulcerations of the vaginal wall, constipation and even fistula, these are just a few possible complications. This device is only but an interim solution for those patients with such severe comorbidities that any degree of surgery is a greater risk than the disease itself.

Last but not the least, uro-gynaecological diseases tend to be treated lightly by the patients and also by the general practitioners which can lead to serious health problems like uretero-hydro-nephrosis, acute or chronic renal failure or even end stage renal disease which needs renal transplantation or dialysis.

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Manuscript received: 11.05.2019