Review

Current management of overactive bladder: Insight from developing country

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Overactive bladder (OAB) is a chronic, debilitating and highly prevalent condition occurred in all age, especially among elderly affecting quality of life such as socioeconomic, psychological, occupational, domestic, physical and sexual functioning. The management of OAB can be nonpharmacologic interventions, pharmacologic interventions or combination of both. There are several substances involving smooth muscle relaxants, tricyclic antidepressants herbal medicine that can be used to encourage this OAB but still uncovered, this is a challenge for clinicians to investigate further regarding herbal medicine for OAB in order to suppress cost of OAB management because herbal medicine especially in Indonesia is cheaper than synthetic substances. The successful of management of OAB is influenced by many factors, especially from developing country such as Indonesia is the compliance of patients. The comprehensive and better understanding of this disorder is needed in order to manage OAB comprehensively. This article discuss about the comprehensive approach for managing OAB based on the clinical experience among developing country.

Keyword: Overactive bladder. Elderly, herbal medicine

INTRODUCTION

Overactive bladder (OAB) defined as urgency with or without urge incontinence which is usually featured with frequency and nocturia in the absence of other pathologic or metabolic conditions that might explain the symptoms is a chronic, debilitating and highly prevalent condition occurred in all age. Its incidence is increased among elderly (MacDiarmid, 2008, Kirby et al., 2006; Dalyana, 2006).

In more than six European countries, it was noticed that this condition affects approximately 17,000 people aged 40 years. In addition, it was reported that 16.9% women and 16% men above 18 years also suffered from OAB (Dalyana, 2006). The severity and nature of the condition’s symptoms may be determined by gender (eg, OAB without urge incontinence is more common in men than in women).

Epidemiological studies demonstrated that there is correlation between incidence of OAB with quality of life such as socioeconomic, psychological, occupational, domestic, physical and sexual functioning (MacDiarmid, 2008; Kirby et al., 2006; Dalyana, 2006; Mullins and Subak, 2005; Tapia et al., 2013; Thomas and Culley, 2008).

There is a few number of studies regarding the socioeconomic impact related with OAB. In United Kingdom annual cost of National Health Service (NHS) in order to cure the symptoms of urinary tract related disorders is approximately 536 million poundsterling, in addition, out of pocket fee from patients around 207 million poundsterling for pampers and other services (Kirby et al., 2006; Tapia et al., 2013).

In US, the total costs associated with overactive bladder were estimated at US$ 12 billion. These expenses comprise indirect costs such as lost productivity, and direct costs, involving diagnosis, treatment, and routine care (Mullins and Subak, 2005). Treatment of OAB include nonpharmacologic interventions, pharmacologic interventions or combination of both. Nonpharmacologic treatment usually include "bladder retraining" which generally consists of
Pathophysiology of OAB

The two functions of the bladder are to store and void urine. The process of micturition involves neural circuits in the brain and spinal cord that coordinate the anatomic components of the lower urinary tract (Andersson and Wein, 2004). However, the direct connection and contribution of these elements are not completely understood.

Normally, as bladder volume increases, involuntary contraction of the detrusor muscle are often associated with overactive volume of urine voided, and the experience of each urination (Tapia et al., 2013; Andersson and Wein, 2004).

Among OAB patients, their bladder transmit false impulses to the brain, resulted in immature contraction happened when its volume is not full enough. As consequence, the patient complains urge and unable to control contraction of bladder.

The symptoms of OAB are usually related to unidentified causes involuntary contraction of detrusor muscle defined as detrusor hyperactivity (Andersson and Wein, 2004; Erdem and Chu, 2006; Gormley, 2008).

There are two theory related to detrusor hyperactivity, first is the myogenic theory. This theory depicts that the increase of detrusor muscle excitability result increase of involuntary pressure of the bladder. Second theory is the neurogenic theory that explain that in OAB, there is impairment of central inhibitory tract or peripheral afferent terminal sensitization affect on primitive urination reflexes which stimulate overactivity of detrusor (Sandhu et al., 2006).

In OAB, it is believe that detrusor muscle hyperactivity causes lack of inhibitory contraction, as a result urgency of urination. The weakness of detrusor muscle causes uncomplete emptying of the bladder and increase frequency of micturition (Sandhu et al., 2006; Erdem and Chu, 2006).

There are several factors which influence of incidence OAB. They are classified into two categories. First of all systemic factors involving metabolic status such as Diabetes, medication or substances causing increase of urine production such as diuretics, caffeine, alcohol, and neurological abnormalities resulted in damage of nerves that control urination such as stroke, infection or injury of brain or spinal cord, multiple sclerosis, and heavy metal intoxications. Second category is lower urinary tract such as infection, inflammation, malignancy, abnormalities or conditions causing urinary flow obstruction such as benign prostate hyperplasia, urinary tract stones(Sandhu et al., 2006).

Diagnosis of OAB

The diagnosis of OAB is recognized from history taking, complete physical examination especially on the abdomen and genital and Neurology examination for identification of sensory problems (Kirby et al., 2006; Tapia et al., 2013; Sandhu et al., 2006).

Overactive bladder symptoms include feeling always want urination, Have experienced urinary urgency, frequency, and nocturia (Tapia et al., 2013; Sandhu et al., 2006).

Overactive bladder without urgency incontinence overactive bladder, often called dry which is about about two-thirds of patients with these disorders. Whereas if the urinary urgency, it is often referred to as overactive bladder wet (Dalyana, 2006).

Physical examination is important in order to determine the cause of OAB such as assessment of pelvic floor for
women to identify stress incontinence, palpation of suprapubic region for determining bladder enlargement and mass, digital rectal examination in men should be considered to assess the size and consistency of the prostate (Dalyana, 2006).

Laboratory examination from urine sample to check for infection, glucose levels and urodynamic tests, to see the function of the bladder and the ability of his emptying completely, uroflowmetry, the measurement of residual urine. Are important as routine examination (Dalyana, 2006; Tapia et al., 2013; Sandhu et al., 2006).

Additional laboratory examination such as cystometry to measure bladder pressure during charge. This procedure can identify the presence of involunter muscle contraction that can indicate the level of pressure which is someone feel like urinating and can measure the pressure needed for bladder emptying, Electromyography to determine the coordination of nerve impulses in the muscles of the bladder and urine sphincter, urodynamics video using x-ray or ultrasound waves to get a picture of the bladder during charging and discharging. This test is usually combined with the cystometry and cystoscopy. Used to see abnormalities on lower urinary tract for example a tumor or urinary tract stones, urinary bladder diary for 3 days to assess symptoms both before and after the experimental treatment should be considered in order to diagnose OAB (Sandhu et al., 2006; Tapia et al., 2013; Dalyana, 2006).

**Management of OAB**

Regarding management of OAB, comprehensive approach is more effective and efficient. In general, the management of OAB divided into two approaches, first is non pharmacological treatment involves the life style changes, bladder training, and pelvic floor exercises and pharmacological treatment (Sandhu et al., 2006; Ouslander, 2004).

Life style changes involve locate the easiest way for toilet, drink sufficient water, avoid caffeine due to its diuretic effect. In some people the alcohol can worsen the symptoms of overactive bladder, especially when combined with caffeine (Ouslander, 2004; Sandhu et al., 2006).

Bladder training also called bladder drill has the purpose to slow down the stretch the bladder so that it can enlarge the volume of the bladder and the patient can remove the urine is only 5 – 6 times in 24 hours. At the same time will reduce the hyperactivity of the bladder muscles. The principle of this exercise is try to stifle and refrain using several ways such as sitting on hard chairs, counting backwards from 100, doing some pelvic floor exercises (Ouslander, 2004; Sandhu et al., 2006; Sussman, 2007; Thomas and Culley, 2008).

This exercise takes several weeks. During this training exercise the bladder should be recorded in a note to monitor the progression. After a few months usually patient will have normal sense of wanting to urinate or go to the toilet.

The successful of bladder training may be depend on the support of the doctors, nurses or coaches and also the intake of enough water (Ouslander, 2004; Sandhu et al., 2006; Sussman, 2007; Thomas and Culley, 2008).

Pelvic floor exercises is the main approach for stress incontinence. This exercise includes exercise to strengthen muscles surrounded the lower part of the bladder, uterus and rectum and also supression the pelvic ground when sitting from lying to standing. It remains unclear whether pelvic floor exercises can help urinary urgency without stress incontinence. However, pelvic floor exercises can help if it is done in conjunction with bladder training (Ouslander, 2004; Sandhu et al., 2006).

Another approach is usage of absorbent pad, acupuncture and electrical stimulation. Patient may need to use diapers (absorbent pads) to protect clothing and when unable to urinate (Thomas and Culley, 2008; Oki et al., 2006). Emmon and Otto demonstrated that among 85 women with OAB treated with acupuncture for 4 weeks has a meaningful effect for the improvement of OAB involving on bladder capacity, urgency, frequency and quality of life equivalently to pharmacological therapy and physical therapy or behavior changes (Ouslander, 2004; Emmons and Otto, 2005).

A mild electrical pulse applied through the vagina or anus or use patches on the skin, can be used to stimulate the nerves that control the bladder and sphincter muscles.

In addition, minor surgery in order to provide electrical stimulation can be applied by attaching an electrical wire near the coccyx. In this procedure there are two stages, first the wire is placed and connected with a temporary stimulator that can be taken for a few days. If his condition improves, it will proceed with the second step. Second the electric wire is placed close to the tail bone is connected to the stimulator and permanent that is placed under the skin (Oki et al., 2006). Figure 1.

There are several substances which can be used for treatment of OAB (Thomas and Culley, 2008; Andersson and Wein, 2004; Asimakopoulos et al., 2012; Staskin, 2005; Wagg and Cohen, 2002).

**Antimuscarinic**

Drug commonly used is antimuscarinic which is also commonly referred to anticholinergic. Belonging to this group are: oxybutynin, tolterodine, trospium chloride,
solifenacin and propiverine. These medications work by way of block nerve impulses to bladder that will result in the relaxation of the muscles of the bladder and will increase the capacity of the bladder (Oki et al., 2006; Ouslander, 2004; Hood and Andersson, 2013).

These medicines may improve symptoms in some cases. This improvement will vary on each individual. We recommend a try given the drug for a month or so, if it helps then the medication be continued for six months or more then the medication is stopped and seen how existing symptoms without medication (Asimakopoulos et al., 2012).

The side effects of this drug are frequent but only a light weight and can be tolerated. Frequent side effects are dry mouth, dry eyes, constipation and blurred vision (Asimakopoulos et al., 2012, Hood and Andersson, 2013).

**Oxybutynin**

Oxybutynin is the non-selective antimuscarinic that have activity relaxing the muscles of the bladder and local anesthesia. This dosage can be detached immediately (5 mg TID), off slow (5 or 10 mg O.D.) and transdermal patches (39 cm 2 patch in a dose of 36 mg per patch) that will release 2.4 mg oxybutynin per day for 3-4 days (Oki et al., 2006).

Multicenter Study on Assessment of Transdermal Therapy in Overactive Bladder With Oxybutynin (MATRIX), has evaluated the effects of oxybutynin transdermal system (OXY-TDS; 3.9 mg/h) towards the quality of life and safety of the drug. On the research for 6 months to adult patients including 699 2878 age 75 years or old. This study demonstrated that the OXY-TDS improves quality of life and can be well tolerated and safe. OXY-TDS seems to constitute an ideal OAB therapy in the elderly. The granting of two times per week can improve patient compliance and in some patients aged prefers to wear a ‘patch’ rather than a pill (Emmons and Otto, 2005).

**Tolterodine**

Tolterodine is an antagonist of muscarinic agent which is available in the form of short-acting and long-acting. Various clinical test showed that 2 mg or 4 mg per day will be just as effective as administering oxybutynin 5 mg or 10 mg per day (Oki et al., 2006).

**Propiverine dan trospium**

The drug is effective for OAB and drug side effects are minimal compared to oxybutynin short-acting (Oki et al., 2006, Wagg and Cohen, 2002, Asimakopoulos et al., 2012, Hood and Andersson, 2013).

**Estrogen**

Local vaginal preparations are more effective than oral estrogens, but existing data about its effectiveness limited (Emmons and Otto, 2005, Hood and Andersson, 2013).

**Antagonis Alpha-adrenergic**

These agents are very useful in men with benign prostate enlargement. Serious side effects are postural hypotension. The dose used is raised gradually to overcome the effects of tolerance (Hood and Andersson, 2013).
Imipramine

An antidepressant effect of anticholinergic and tricyclic with alpha-adrenergic. It may have the effect reflex against Central bladder emptying so it is recommended to mix the urgency incontinence-stress. Its use should be carefully because side effects of postural hypotension and cardiac conduction disturbances (Hood and Andersson, 2013).

Darifenacin and solifenacin

A antimuscarinic future with selective receptor antagonist Action M3 and less systemic effect anticholinergic (Jha and Parsons, 2006).

Capsaicin and resiniferatoxin

An promised intravesical agent to overcome the increase of reflexes of detrusor muscle in neurogenic bladder.

Botulinum Toxin (Botox)

There are some subtype botulinum toxin antigen which is already known, namely: A, B, C1, D, E, F, and G. Types A and B are used in urology. Botulinum toxin in action by way of inhibiting the release of acetylcholine from the nerve endings kolinergik interacting with the protein complex that is used to populate the acetylcholine vesicles. Effects of botulinum toxin was losing muscle contraction and muscle atrophy at the site of the injection. Chemical denervation are reversible and the regeneration of the axon will occur within approximately 3-6 months. Administration of botulinum toxin in sufficient quantities will inhibit the release of acetylcholine and other neurotransmitters. The molecules cannot pass through the brain barrier so it has no effect on the CNS. The use of botulinum toxin is rising quickly, used to treat neurogenic detrusor idiopathic overaktivitas and by means of the injection of (Sahai et al., 2007; MacDiarmid, 2008).

CONCLUSION

To sum up, OAB is multicausal condition influencing the activity of detrusor muscle result in the urgency and frequency of urination with consequence on patients quality of life involving psychological and socioeconomic problems. The comprehensive and better understanding of this disorders is needed in order to manage OAB comprehensively.

Future Prospect and Suggestion

Regarding pharmacological theurapeutic approach, there are several substances involving herbal medicine that can be used to encourage this OAB but still uncovered, this is a challenge for clinicians to investigate further regarding herbal medicine for OAB in order to suppress cost of OAB management because herbal medicine especially in Indonesia is cheaper than synthetic substances.

Herbal medicine

Despite of synthetic substances, there are some herbal medicine used for the treatment of OAB. One of the most popular is a traditional Chinese medicine using Goshajinki-gan (Ogushi and Takahashi, 2007). Previous study demonstrated that Goshi-jinki-gan ma be a new potential therapeutic agent for OAB without deterioration of voiding function in men with benign prostate obstruction (Kajiwara and Mutaguchi, 2008). Another herbal medicine is Ganoderma lucidum is well tolerated and there is an improvement of symptoms of OAB. The recommended dose of extract of Ganoderma lucidum is 6 mg in men with lower urinary tract symptoms (Noguchi et al., 2008).

In addition, surgery approach can be considered when pharmacological or changes of life style are failed in order to manage OAB (Gormley, 2008, Erdem and Chu, 2006). The aim of surgical treatment is to increase the ability of the filling of the bladder and reduce pressure on the bladder. By Stimulation of the nervus Sacralis which is done by installing pacemaker under the skin of the abdomen and connected by a small cable that is placed near the coccyx area sacralis. Modulation of nerve impulses can improve the symptoms of OAB. Another surgery procedure is augmentation cystoplasty. This reconstruction procedure used to increase bladder capacity, by using a portion of the intestine to replace most of the bladder. On the procedure required a catheter to empty the bladder (Gormley, 2008).

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REFERENCES


