

A Summary of Acupuncture and Moxibustion Therapy for the Urinary Tract Infection after Stroke

Yuanbo Fu¹, Ling Fan^{2*} and Tong Feng¹

¹Department of Acupuncture and Moxibustion, Beijing Hospital of Traditional Chinese Medicine affiliated to Capital Medical University, Beijing, China

²Department of Acupuncture and Moxibustion, Guangdong Provincial Hospital of Traditional Chinese Medicine, Guangzhou, China

*Corresponding author: Ling Fan, Department of Acupuncture and Moxibustion, Guangdong Provincial Hospital of TCM, No.111 Dade Road Yuexiu District, Guangzhou Guangdong, China, Tel: +86 18665698839; E-mail: 546624680@qq.com

Received date: June 07, 2016, Accepted date: June 23, 2016, Published date: June 25, 2016

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Abstract

As a common disease, stroke could be divided into two types: ischemic and haemorrhagic. The classic risk factors for stroke include hypertension, hyperlipidaemia, tobacco smoking, obesity, diabetes mellitus, previous TIA, and atrial fibrillation. WHO pointed to the survey data that stroke was the second factor leading to death worldwide (the first factor is heart disease). And stroke is a leading cause of disability in the United States. There are amount of complications of stroke, among them, urinary tract infection is a recognized complication of stroke. Gram-negative bacteria is the most common cause of infection among them, *Escherichia coli* is the most common germ, accounting for 85 per cent, some research indicated that urinary tract infection is obviously correlated with prognosis of stroke. Factors claimed to predict increased risk of urinary tract infection include stroke severity, depressed conscious level increased post-void residual urine volume and diabetes mellitus. Urinary tract infection is common complication of stroke, it could increase the mortality among stroke patient, undermine the effect of rehabilitation, due to the progressing stroke. Due to the complication of hemiplegia, the patients lost their motor function largely, and it would tremendously increase the risk of infections. Urinary tract infection could be classified into two types: the upper urinary tract infection and the lower urinary tract infection. The former is known as pyelonephritis and the latter is known as cystitis. Complicated urinary tract infection ultimately could generate nephropylitis, damage renal function, even can be life-threatening. In addition, the nursing of such patients is difficult, resulting extra health costs, substantial economic burden. Traditional Chinese medicine has the principle of rendering the treatment according to the differentiation of the syndrome, and can be utilized on various diseases. Acupuncture and moxibustion is a key component of traditional Chinese medicine therapy. This traditional Chinese medicine therapy is effective, convenient, inexpensive and less side-effect. Especially in infectious diseases, acupuncture and moxibustion has the superiority to the other methods. Acupuncture and moxibustion is a safe and effective therapy for urination disorders and the urinary tract infection after stroke.

Keywords: Moxibustion therapy; Acupuncture; Urinary tract infection; Nephropylitis

Stroke Is a High Risk Disease in the World

Cerebral stroke also known as cerebrovascular accident (CVA), or brain attack, Stroke is an acute brain vascular disease, caused by the rupture of cerebrovascular or angiempthaxis when poor blood flow to the brain results in cell death. Thus stroke could be divided into two major types: ischemic and haemorrhagic, of which over 60 per cent are ischemic stroke much higher than the haemorrhagic stroke. Internal carotid artery occlusion and vertebral origin stenosis could result in ischemic stroke and male more than female on the incidence. However the mortality of haemorrhagic stroke is higher. According to the survey, the stroke is the leading factor of death in China.

The result of cerebral apoplexy is the damaged part of the brain may malfunction. Symptoms include: dizziness, limb weakness, and stroke hemiplegia and muscle weakness of the face, facial distortion, barylalia, obnubilation, excessive reflexes, and obligatory synergies [1]. It is diagnosed clinically and confirmed by computerized axial tomography (CT) or magnetic resonance imaging (MRI) typically.

The risk factors for stroke include hypertension, hypotension, hyperlipidaemia, obesity, diabetes mellitus, smoking, age, gene, heart

disease, high salt and fat diet etc. But the main risk factor is high blood pressure.

According to the data (6.2 million deaths, 11% of the global death toll), WHO indicated that stroke was the second most frequent cause of death worldwide in 2011. Approximately 17 million people had a stroke in 2010 and 33 million people have previously had a stroke and were still alive. In the developed world, the number of strokes declined by nearly 10 per cent and increased by 10% in the developing world between 1990 and 2010. According to the data (6.4 million deaths, 12% of the global death toll). About 3.3 million deaths resulted from ischemic stroke while 3.2 million deaths resulted from haemorrhagic stroke. The survival rate of stroke patient is about 50 per cent after one year. Overall, two thirds of strokes occurred in those over 65 years old [2].

WHO pointed to the survey data that stroke were the second factors leading to death worldwide (the first factor is heart disease). And stroke is a leading cause of disability in the United States according [3].

As the number of the aged increases, the burden of stroke is likely to increase correspondingly in the next few decades, this will not only brings a large burden to budget, also cause a series of social problems, in the United States, the cost of treatment and rehabilitation for post-stroke patients is projected at USD 40 billion per year [4].

Urinary Tract Infection Is a Common Complication of Stroke

There are also amount of complications of stroke, like stroke progression, stroke recurrence, seizures, urinary tract infection, chest infections, deep vein thrombosis, pulmonary embolism, nonserious falls, acute MI (myocardial infarction) [4] and others.

Some research indicated that urinary tract infection is obviously correlated with prognosis of stroke. Jian-hong collected 344 patients with brain stroke 79 cases of patients appeared urinary tract infections, the incidence rate was 22.97%; totally 104 pathogens were isolated including 64 strains of gram-negative bacteria (61.5%) 40 strains of gram-positive bacteria (38.5%) of which *Escherichia coli* and *Staphylococcus aureus* accounted for the majority, respectively 37.50% and 25.96%. The risk factors included: over 60 years of age over 4 weeks of hospital stay, combination of a variety of antibiotics, invasive diagnosis and treatments, catheters indwelling hypoalbuminemia 4-6 grade of Brunstorm ($P < 0.05$). Conclusion was that the elderly hospitalized patients with brain stroke have high incidence rate of urinary tract infections and the influencing factors are various. The targeted anti-infective therapy should be selected on the basis of effective control of relevant factors [5].

Bent Indredavik studied on 489 acute stroke patients. In the first week, the patients are followed up with assessments of 16 prespecified complications. 244 of the patients were randomly allocated to a 3-month follow-up. Then he have found that during the first week, urinary tract infection morbidity rate is 16% (78 of 489), and during the 3-month follow-up, urinary tract infection morbidity rate is 27.9% (68 of 489) [6]. Factors claimed to predict increased risk of urinary tract infection include stroke severity, depressed conscious level increased post-void residual urine volume and diabetes mellitus.

Wein claimed that on admission in the acute stage; more than 50% of an unselected stroke population have urinary incontinence. The proportion declines to one third of the surviving patients at 12 months. In the acute stage of apoplexy, the survivors who are urinary incontinent have a quadruple higher risk to be institutionalised after 1 year [7]. There is a strong correlation between urinary incontinence and urinary tract infection.

The Risk of Urinary Tract Infection

Among the common complication, urinary tract infection is a recognized complication of stroke. Due to the complication of hemiplegia, the patients lost their motor function largely, and it will tremendously increase the risk of infections. Urinary tract infection could increase the mortality among stroke patient; undermine the effect of rehabilitation, due to the progressing stroke.

A urinary tract infection is an infection that affects part of the urinary tract. It could be classified into two types: the upper urinary tract infection and the lower urinary tract infection. The former is known as kidney infection (pyelonephritis) and the latter is known as a bladder infection (cystitis) [8]. Cystitis accounts for about more than 60% in the urinary tract infection; the symptom may include frequent micturition, the urgency of urination, the urine pain, flank pain, dysuria, and cloudy urine but rarely with haematuria. Symptoms of a kidney infection may include fever, chill, headache, sick, vomit. Asymptomatic bacteriuria often can be seen in the old woman and the pregnant women, it usually has no symptom.

Gram-negative bacteria is the most common cause of infection among them, *Escherichia coli* is the most common germ, accounting for 85 per cent, other bacteria are *Klebsiella pneumoniae*, *Proteus vulgaris*, *Citrobacter amalonaticus*, gram-positive bacteria also can cause urinary tract infection, accounting for 85 per cent. The classic risk factors for urinary tract infection include female physical structure, sexual behaviour, diabetes mellitus, obesity, and family heredity [9]. Kidney infection usually follows a bladder infection but it also could result from a blood-borne infection.

Due to the mobility problems, age of patients, hypo immunity, extensive usage of the antibiotics, unnecessary catheters in urinary tract infection, the risk of urinary tract infection could increase. Urinary catheterization increases the risk of urinary tract infections. The risk of bacteriuria is between three and six per cent per day and prophylactic antibiotics are not effective in decreasing symptomatic infections [10]. It has been claimed that there is an independent association between urinary tract infection and poor stroke outcome [11]. Complicated urinary tract infection ultimately could generate nephropylitis, damage renal function, even can be life-threatening. In addition, the nursing of such patients is difficult, resulting extra health costs, substantial economic burden.

The regular therapy is antibiotics. For cystitis, Sulphonamides, quinolones, Semisynthetic Penicillin's and cephalosporin's can be utilized for infection. Phenazopyridine is used during the first few days, especially to help with the burning, urinary urgency and bladder discomfort [12]. For pyelonephritis, Quinolones could be used. However, the antibiotics sometimes could elevate the risk of methemoglobinemia (higher than normal level of methemoglobin in the blood) [13]. Acetaminophen (paracetamol) only use on fevers [14], and it may cause liver damage after long term usage. As a matter of fact, there is no radical cure for urinary tract infection in clinical.

Acupuncture and Moxibustion Therapy for Urinary Tract Infection

Acupuncture and moxibustion is a key part of traditional Chinese medicine and also is important component of oriental medicine, involving the practice of inserting thin needle in to specific body points and using moxa made from dried mugwort to burn on the point or let the point expose to smog. The principle of acupuncture should be: stimulating the body surface on acupoints with acupuncture and moxibustion, to adjust blood and viscera function through the body of the meridian conduction.

Traditional Chinese medicine has the principle of rendering the treatment according to the differentiation of the syndrome, and could be utilize on various disease. As a key component of traditional Chinese medicine therapy, acupuncture and moxibustion is effective, convenient, inexpensive and less side-effect. Especially in infectious diseases, acupuncture and moxibustion has the superiority to the other methods.

JIANG Man collected 32 cases of urinary tract infection; acupoints are Zhongji (CV3), Guanyuan (RE4), Shuidao (ST28), Yinlingquan (SP9), Sanjinjiao (SP6), Diji (SP8), Pishu (BL20), Shenshu (BL23). The acupoints on abdomen and back adopted warm needling, others adopted common acupuncture. The result was that 14 cases have recovered, 11 essentially recovered, 5 improvements, and 2 were invalid. The total effective rate was 93.75% [15]. This research showed that warm needling therapy on urinary tract infection curative effect is accurate.

LI Wei-na applied acupuncture therapy to 50 cases of urinary tract infection which were managed in the principle of rendering the treatment according to the syndrome differentiation; locate points at Chengjiang (RE24), Guanyuan (RE4). For calculus, add Weiyang (BL39) Shenshu (BL23), Ashi; for prostatitis, add Shenshu (BL23), Yinlingquan (SP9); for turbid urine and feeble, add Baihui (DU20), Zhaohai (KI6); for the pain of lower abdomen, add Ququan (LI8), with moxibustion therapy on Guanyuan (RE4); for blood in urine, add Xuehai (SP10), Sanyinjiao (SP6); for fever, add Hegu (LI4), Quchi (LI10). The result was that 80% patients have recovered, 20% patients have essentially recovered. The total effective rate was 100% [16].

Urinary catheterization is an essential and convenient method, which is used for the patients of urinary retention and urinary incontinence. However, urinary catheterization could be a risk factor of urinary tract infection. Stott studied 412 patients; 65 (15.8%) were diagnosed with urinary tract infection, on average, the infection occurs 14 days after stroke (within a range of four to thirty-nine days). In an analysis of regression, the result showed urinary tract infection are highly relevant with urinary catheterization (OR=3.03, 95% CI 1.41-6.52), higher mRS (OR=1.85, 1.29-2.64) and increasing age (OR=1.51, 1.13-2.00). The conclusions were that urinary tract infection is common after acute stroke. It is associated with urinary catheterization, post-stroke disability and increasing age. Avoiding using of catheterization might reduce the risk of infection [17]. Acupuncture and moxibustion is a safe and effective therapy for urination disorders after stroke.

Moxibustion therapy could warm meridians, promoting circulation of "qi" and blood. The therapy could be classified into three types: moxa-cone moxibustion, moxa-stick moxibustion and needle warming moxibustion. Moxa-cone moxibustion includes direct moxibustion and indirect moxibustion. Indirect moxibustion therapy is works through put something like ginger, garlic, salt or aconite cake on skin, then put a moxa-cone on it and burn the moxa-cone. The ginger-separated moxibustion is for the treatment of vomiting, abdominal pain and diarrhoea which are caused by cold and wind. The garlic-partitioned moxibustion is for the treatment of scrofula. The salt-partitioned moxibustion is for post stroke desertion disease. The aconite cake-separated moxibustion is for the syndrome of decline vital gate fire.

LIU Hui-lin collected 75 patients from Beijing Hospital of Traditional Chinese Medicine affiliated to Capital Medical University in October 2014 to March 2006, the patients are cerebral apoplexy, which are include cerebral infarction and cerebral haemorrhage, with urination disorders induced by neurogenic bladder at restoration stage. The 75 cases were randomized into a treatment group (treated with ginger-salt-partitioned moxibustion at Shenque (CV 8)) and a control group (treated with routine acupuncture). The treatments were given 5 times each week, and then observe the curative effect after 3 weeks. The results showed that in the aspect of increasing degree of urinary incontinence treatment group was better than the control group ($P<0.01$, $P<0.05$) [18].

Yang Ding-lin treated 49 patients with urinary retention by acupuncture. The 49 patients in this group were all primiparae. Three had retention of urine section after caesarean section, 12 after episiotomy, 24 after repair of perineal laceration and 9 after forceps assisted delivery. Of the 49 patients, 18 had retention of urine for 4 days and 31 for more than 5 days. The points Sanyinjiao (SP6) and Zusanli (St36) on the right side were punctured 1.5-2.0 cm deep and moderate stimulation was applied. The needles were retained for 30 minutes after achieving Qi and were manipulated once every 3-5

minutes. All this procedure was done twice a day. Result: Among the 49 cases, 19 cases had self-urination after 1 session, 23 cases had self-urination after 2 sessions, 5 cases had self-urination after 3 sessions, 2 cases had self-urination after 4 sessions. All 49 patients were completely cured after averagely 1.9 sessions [19]. Consequently, the morbidity rate of urinary tract infection has been decreased.

Conclusion

Urinary tract infection is common complication of stroke and it is also a risk factor to death, complicated urinary tract infection ultimately could generate nephropylitis, damage renal function, even can be life-threatening. In addition, the nursing of such patients is difficult. TCM has the principle of rendering the treatment according to the differentiation of the syndrome, and can be utilize on various disease. It, resulting extra health costs, substantial economic burden. As a key component of TCM therapy, acupuncture and moxibustion is effective, convenient, inexpensive and less side-effect. Especially in infectious diseases, acupuncture and moxibustion has the superiority to the other methods.

Funding

The researches were supported by: 1. Youth fund project of the Natural Science Foundation of China: (No. 81303041); 2. Class general financial grant from the China postdoctoral science foundation: (No. 2012M511784); 3. Science foundation of the outstanding young innovative personnel of department of education Guangdong Province: (No. 2012LYM_0043); 4. Special research foundation of the new teacher category for the doctoral program of higher school by National ministry of education (No. 20124425120005); 5. Special financial grant from the China postdoctoral science foundation: (No. 2013T60793); 6. Science foundation of the postdoctoral researchers in Guangzhou University of Chinese Medicine from Guangdong Provincial Department of human resources and social security fund: (No. BBK429122K19); 7. National Natural Science Foundation of China (No. 81403448); 8. Beijing Natural Science Foundation (No. 7154206); 9. Beijing Municipal Administration of Hospitals' Youth Programme (QML20150904).

Disclosure Statement

The authors declared no potential conflicts of interests with respect to the authorship and publication of this article.

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