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The Comparison of the Effects of Pessary, Pelvic Floor Physiotherapy, and Corrective Surgery Methods in Correction of Vaginal Sound in Patients with Pelvic Floor Disorders

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Abstract

Aim and Background: Vaginal sounds is a common complaint in women affected by pelvic floor disorders, and can be the cause of their referral to physician. In this study, we evaluate the effectiveness of present treatments. Evaluation Method: In this cross sectional study, 90 patients who were referred to Tabriz's educational centers because of vaginal sounds were assessed and classified to three treatment groups including pessary, physiotherapy, and modifying surgery. Afterwards, the effects of received treatment on quality of life and sexual relations, and decreasing the signs were evaluated. Findings: Mean age of patients were 52.56 ±14.44 years old. 85.6% of patients had degrees of other pelvic problems such as dysuria and so on. This difference between three groups were not statistically significant (P=0.70). Statistical comparison of the three groups indicated that the effect of treatment on sexual activity and quality of life of the patients had a significant difference (respectively P<0.001 and P=0.01), and the difference in the first group was more than other groups. In the evaluation of relationship between treatment and effect on patient, though no significant difference was seen (P=0.58), consent frompessary method was more than other methods and less than surgery. Conclusion: These findings indicated the effect of natural parturition on vaginal flatulence. The time with highest occurrence of this disorder was during sexual intercourse. Most of patients had also other pelvic disorders. Between three treatment methods, pessary was better than others and had a significant effect on quality of life and sexual relations.

Key words: vaginal sounds-pessary- physiotherapy- pelvic floor modifying surgery.

Introduction

Vaginal sound is a common complaint in women who referred to clinic, and many of them (especially multipara and young women with pelvic floor disorders) had referred to clinic because of this problem, and sometimes it was the main cause of their referral. (Krissi *et al.*, 2003; Veisi *et al.*, 2012) The embracement and bad feeling due to this disorder, especially during religious praying in which cleanness is very important for a Muslim woman based on culture and religion. Etiology and exact mechanism of this problem is not clear. However, one of the suggested mechanisms is shown to be trapping air in vagina due to pelvic prolapse, enlargement of vaginal entrance, and vaginal floppy. (Krissi *et al.*, 2003) Some studies introduced perineal failure as the primary cause of vaginal sound which results in floppy in vagina and its entrance. Based on them, the potential space in vagina fills easily with air during rest time or sexual intercourses, and makes the unpleasant sound as the air goes out due to changing position of the patient. (Miranne *et al.*, 2015; Jeffery *et al.*, 2008; Attapattu, 1995; Hsu, 2007)

Some studies introduced stiffness and inflexibility of vaginal wall to be responsible for making vaginal sound and flatulence. This problem can be caused by pelvic inflammation, pelvic radiography, tumors which attack to vaginal wall, and finally, edema and fibrosis due to surgery. (Hadar *et al.*, 1991)

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In a study, low weight and body mass is a cause of vaginal sound and flatulence. Most probably weakness of walls and absence of fat pads in vaginal wall will results in weakness of these walls and undesired entrance of air into vagina. (Veisi *et al.*, 2012)

Many risk factors have introduced for this problem: perineal failure and vaginal entrance floppy, (Attapattu, 1995) history of several cesarean section, (Hsu, 2007) low body mass index (BMI), fertility age, (Veisi *et al.*, 2012) vaginal parturition, prolapse of pelvic organs, urinary incontinence, (Jeffery *et al.*, 2008) history of vaginal surgery, high parity and fecal incontinence and anal failure. (Slieker-ten Hove *et al.*, 2009) Only one study mentioned protective factors, based on which, aging and menopause can act as a protective factor. (Miranne *et al.*, 2015)

Vaginal sound could be a sign for important diseases and disorders. Correlation study for this problem indicated that vaginal sound and flatulence has a special relationship whit prolapse of pelvic organs. (Jeffery *et al.*, 2008; Lonnée-Hoffmann *et al.*, 2014; Allahdin, 2011) Moreover, some malignancies could be correlated to this problem. (Hadar *et al.*, 1991)

Organ prolapse is common in elderly women and is a costly disease. It occurs due to weakening of protective structures due to real gaps or tears, or disruption in muscular-neural performance. Although there is some degrees of pelvic prolapse in almost 50% of women with ages over 50 years old, just less than 20% of them seek for a treatment for their problem. This is due to several reasons such as absence of signs, embracement, and/or false opinions about therapeutic methods. Prolapse of pelvic organs in most of cases comes along with signs of urinary dysfunction such as Incontinence, frequency, pain and anorexia, or with symptoms associated with fecal excretion, or with symptoms such as dyspnea pelvic pain and vaginal sound. (Burkman, 2012)

Sectional studies have performed to solve the problem of vaginal sound, and/or assess the effect of pelvic prolapse treatments on modification of vaginal sound, however, there are few numbers of such studies and etiology of the problem remained unclear. (Miranne *et al.*, 2015) No specific treatment has mentioned for vaginal sound. The effect of some therapeutic methods including prolapse modifying surgery, pelvic floor physiotherapy, and puttingpessary is showed for the problem, though their effects were limited to sectional studies. (Attapattu, 1995)

Modification treatments include two surgical and non-surgical (such as pessary and pelvic floor physiotherapy) methods. Non-surgical methods are used in women with mild to moderate prolapse, women who want to maintain fertility, those who cannot undergo surgery due to underlying illnesses, and those who don't like to have surgery. The main goals of the surgery are to relieve symptoms, and (in most cases) to maintain vaginal anatomy, and often is used in patients who have not responded to conservative treatment, or who that do not like to use conservative treatment, and/ or those who have prolapse with degrees higher than 5. (Burkman, 2012)

Accompaniment of this sign with pelvic floor disorders is also important; as in many patients with these disorders, the only appeared sign may be vaginal sound, so, it is important to assess all details of this problem. (Lonnée-Hoffmann *et al.*, 2014; Allahdin, 2011)

Until now, no preferred method has been introduced for treatment of this sign. So, the present study is designed and performed in order to play a role in solving this problem.

Evaluation Method

This study was approved by the Ethics Committee of the Tabriz University of Medical Sciences on 27th may 1397.Approval ID is IR.TBZMED.REC.1397.205.

In this cross sectional study, 90 patients were assessed who were referred to women clinic of Al-Zahra and Taleghani educational centers from May 2016 to January 2017, and their main complaint was vaginal sound. The main inclusion criteria were vaginal sound sign, history of pregnancy, and history of corrective surgery in the pelvic floor area. Written aware consent were obtained of all patients and then, a questionnaire completed which included their personal properties, midwifery history, age, weight, and referral cause. Afterwards, vaginal examination performed with speculum, and pelvic floor assessed for disorders and other problems. Pelvic floor disorder rated based on pop-Q system (from 1 to 4), and standard treatment were selected by Urogynocologists and according to scientific resources and condition of patient. Patients were classified to three pessary, physiotherapy, and surgery groups and there were 30 patients in each group.

Two months later, the patients were reassessed and a questionnaire completed for each patient to evaluate the vaginal sound modification and its effect on their quality of life. Results of the effect of treatment on quality of life and sexual intercourses, and decreasing patients signs were assessed and compared.

Data analysis

Data obtained of questionnaire were entered in SPSS 21 software and compared between three groups using descriptive statistics parameters, t-independent test, and chi-square test. Questionnaire was designed based on current articles and approved and standardized by several Obstetrician Gynecologist and Midwifery Specialist.

General findings:

This study was performed on patients with vaginal sound complain. The aim of this study was to investigate the effects of treatment methods including the use of pessary, physiotherapy, and pelvic floor disorder corrective surgery and colporrhaphy, in three separated groups.

Mean age of all studied patients was 52.56±14.44 years old. In the first group which pessary were used to remove vaginal flatulence, mean age was 61±14.30 years old. In physiotherapy group, mean age was 52.06±13.50. In the third group which had surgery, mean age was 44.63±10.71 years old. This difference between three groups was statistically significant (P<0.001). This difference was also significant in two by two comparison of groups.

Mean weight of all studied patients was 70.30±7.04 Kg. In the first group, mean weight was 71.40±7.86 Kg. In the second group, mean weight was 70.90±7.77 Kg, and in the third group, mean weight was 68.60±5.05 Kg. This difference between three groups was not statistically significant (P=0.44). This difference was not also significant in two by two comparison of groups. Among all patients, totally 88 natural delivery (NVD) history, and 21 cesarean section (C / S) history were reported. And only 2 cases were Nulliparous (2.2%).

There were no significant differences between three groups in terms of the frequency of normal delivery (P = 0.61). Also, there was no difference between three groups in terms of frequency of cesarean delivery (P = 0.11).

Among all patients, 46 patients were menopaused (51.1%), and 44 patients were not menopaused (48.9%). In the first group, 24 patients were menopaused (80%) and 6 patients were not menopaused (20%). In the second group, 14 patients were menopaused (46.7%) and 16 patients were not menopaused (53.3%). In the surgery group, 8 patients were menopaused (26.7%) and 22 patients were not menopaused (73.3%). This difference were statistically significant between three groups (p<0.001).

In examination of patients, findings of prolapse were reported. Overall frequency of this problem was: 13 cases were normal (14.4%), 16 cases had grade 1 prolapse (17.8%), 19 cases had grade 2 prolapse, 32 cases had grade 3 prolapse (35.6%), and 10 cases had total prolapse (11.1%).

In the first group, 20 cases had grade 3 prolapse (66.7%), and 10 cases had total prolapse (33.3%). In the second group, 13 cases were normal (43.3%), 11 cases had grade 1 prolapse (36.7%), and 6 cases had grade 2 prolapse (20%). In the third group, 17 cases had grade 2 prolapse (56.7), and 13 cases had grade 3 prolapse (43.3%).

There were statistical significant differences between three groups (P = 0.01). Also, there was obvious statistical significant difference between in two by two assessment using Post Hoc statistical method (P<0.001).

Patients were questioned about other pelvic problems such as urogenital irritation, incontinence and dyspareunia. Most of patients ad degrees of mentioned signs, so it was not possible to separate each sign, and all signs considered as a part of study entitled other pelvic symptoms. In this case, among 90 participants, 13 patients had no signs (14.4%), while 77 patients had degrees of mentioned signs (85.6%). This difference were not statistically significant (P=0.70).

Specific findings of the study by the groups, after onset of treatment

Time of vaginal sound occurrence, after treatment: among all patients, the most common time for vaginal sound occurrence was during sexual intercourse, which affected 56 patients (62.2%). In 16 cases (17.8%), the problem mostly occurred during urinating, and in 18 cases (20%), the problem occurred during daily activities and light exercise.

In the first group, the problem occurred during sexual intercourses in 21 cases (70%), during urinating in 3 cases (10%), and during daily activities in 6 cases (20%). In the second group, the problem occurred during sexual intercourses in 18 cases (60%), and during urinating and daily activities and light exercises in 6 cases (20%). In the third group, the problem occurred during sexual intercourses in 17 cases (56.7%), during urinating in 7 cases (23.3%), and during daily activities in 6 cases (20%).

There was no significant differences between three groups (p=0.69). Also, no correlation founded between the treatment and time of vaginal sound occurrence (p=0.71).

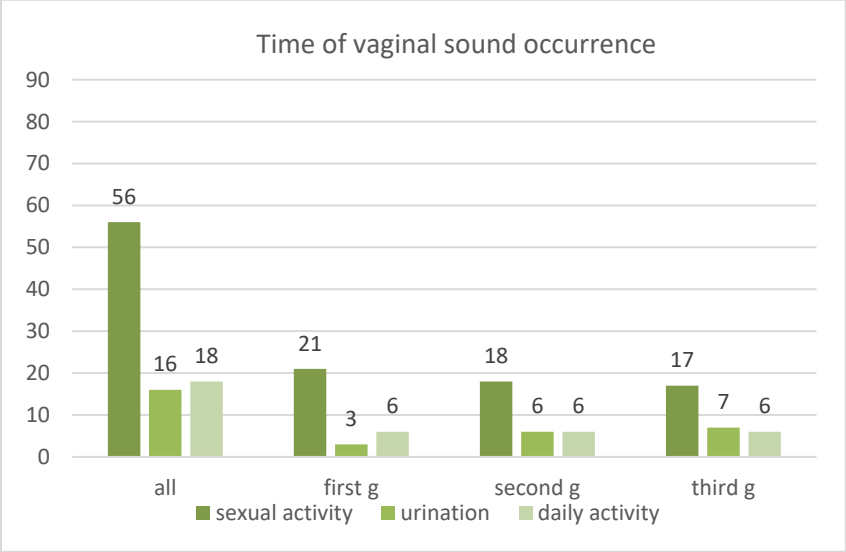

Chart 1- Frequency of vaginal sound by the groups

Frequency of times which vaginal sound occurs, after treatment: total evaluation of patients indicated that 20 cases (22.2) had daily vaginal sound occurrence. While 32 cases (35.6%) had weekly, and 38 cases (42.2%) had monthly vaginal sound.

In the first group, 5 cases (16.7%) had daily, 11 cases (36.7%) had weekly, and 14 cases (46.7%) had monthly vaginal sound. In the second group, 10 cases (33.3%) had daily, 9 cases (30%) had weekly, and 11 cases (36.7%) had monthly vaginal sound. In the third group, 5 cases (16.7%) had daily, 12 cases (40 %) had weekly, and 13 cases (43. 3%) had monthly vaginal sound.

This difference between three groups was not statistically significant (p=0.40). Also, no significant correlation were found between therapeutic method and frequency of vaginal sound occurrence (p=0.50). Based on statistical analysis using chi-square and correlation coefficient(R=0.18), first method had more effect than other methods in frequency of vaginal sound, however the difference was insignificant. Also, two by two group comparison with post hoc method, showed no significant difference between groups.

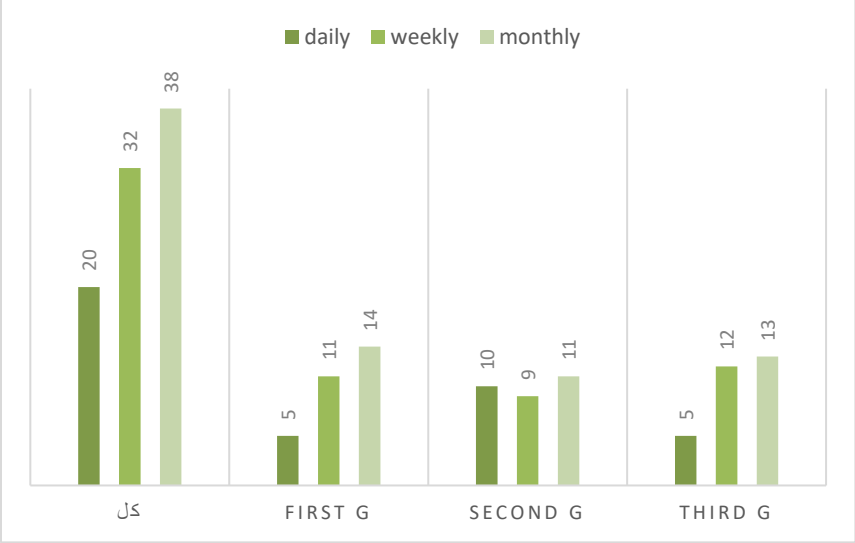

Chart 2- Frequency of times which vaginal sound occurs, after treatment

Treatment duration: In the first group, from the beginning of treatment, a mean of 6.40±7.30 months with 1 month at the lowest rate, and 36 months at the highest rate were seen. In the second group, 6.60±7.64 months with 2 month at the lowest rate, and 36 months at the highest rate, and in the third group, 2.85±5.33 months with 2 month at the lowest rate, and 12 months at the highest rate were seen. These differences between three groups were not statistically significant (p=0.78).

Effect of treatment on the patient: Among all patients, effect of treatment on the patient or actually the consent rate of patients were low in 31 cases (34.4%), medium in 45 cases (50%), and high in 14 cases (15.6%).

In the first group, effect of treatment on the patients in 10 cases were low (33.3%), in 16 cases were medium (53.3%), and in 4 cases were high (13.3%). In the second group, the effect were reported to be low in 11 cases (36.7%), medium in 12 cases (40%), and high in 7 cases (23.3%). In the third group, effect of treatment on the patient in 10 cases were low (33.3%), in 17 cases were medium (56.7%), and in 17 cases were high (10%).

This difference between three groups was not statistically significant (p=0.90). Also, no significant correlation were found between treatment and its effect on patient, and no significant correlation was shown between type of treatment and consent of patient (p=0.58). However, based on Pearson's correlation coefficient (R=0.58), the consent for pessary method was higher than other groups, and for surgery method was lower than other groups.

Effect of treatment on patent's partner: Among all patients, effect of treatment on consent of patient's partner were low in 42 cases (46.7%), medium in 36 cases (40%), and high in 12 cases (13.3%). In the first group, effect of treatment on the patient's partner in 9 cases were low (30%), in 13 cases were medium (43.3%), and in 8 cases were high (26.7%). In the second group, the effect were reported to be low in 13 cases (43.3%), medium in 14 cases (46.7%), and high in 3 cases (10%). In the third group, effect of treatment on the patient's partner in 13 cases were low (43.3%), in 12 cases were medium (40%), and in 5 cases were high (16.7%).

This difference between three groups was not statistically significant (p=0.26). Also, no significant correlation were found between treatment method and consent of patient's partner (p=0.48). However, based oncorrelation coefficient (R=0.13), the consent rate in the first group was higher than others (though it was insignificant).

The effect of treatment on sexual life of patient: Among all patients, 37 cases (41.1%) of patients reported that the effect of treatment was low in their sexual intercourses. This rate was medium in 38 cases (42.2%), and was high in 15 cases (16.7%).

The difference between three groups was statistically significant (p<0.001). In two by two comparison of first and second groups and also first and third groups was significant (respectively P=0.006 and P<0.001). However, this difference was not significant between second and third groups (P=0.25).

The correlation between treatment method and consent of sexual life was statistically significant (p<0.001). Regarding negative correlation coefficient (R=-0.045), this rate in group that used pessary method was significantly higher than other groups.

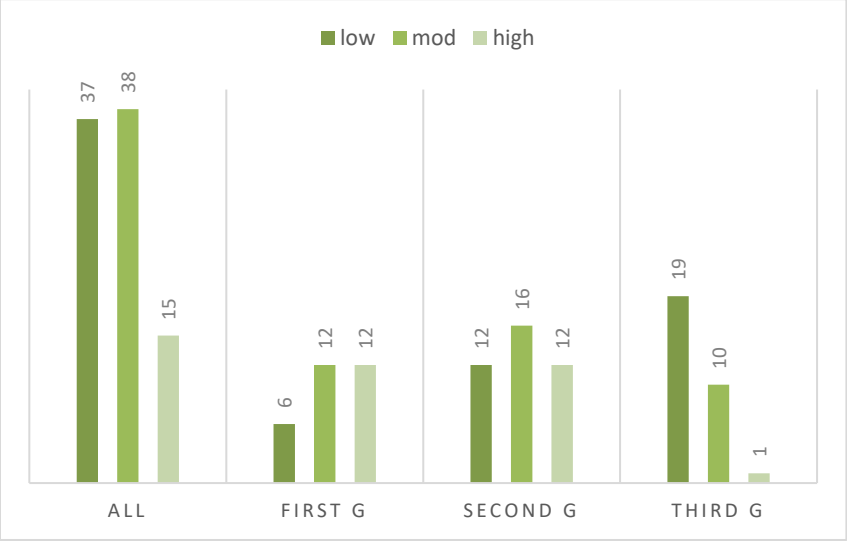

Chart 3- the effect of treatment on sexual life

Effect of treatment on quality of life: Among all patients, effect of treatment on total consent of patient and her quality of life were low in 31 cases (34.4%), medium in 36 cases (40%), and high in 23 cases (25.6%).

In the first group, total consent of patients in 5 cases were low (16.7%), in 14 cases were medium (46.7%), and in 11 cases were high (36.7%). In the second group, the consent were reported to be low in 15 cases (50%), medium in 11 cases (36.7%), and high in 4 cases (13.3%). In the third group, consent of patients in 11 cases were low (36.7%), in 11 cases were medium (36.7%), and in 8 cases were high (26.7%).

This difference between three groups was statistically significant (p=0.01). In group-by-group comparison, there was a significant difference between first and second groups (P=0.01). However, this significant difference was not seen between second and third groups, and first and third groups (respectively p=0.35, p=0.27). in evaluation of correlation between treatment method and total consent of treatment, while no significant correlation was not seen (P=0.07), the therapeutic method of first group had more correlation with consent of patient and her quality of life, in comparison to other groups.

Discussion

In this study, three therapeutic methods (pessary, physiotherapy, and modified surgery) were compared in patients with complain of vaginal sound. Our findings showed that total consent from treatment, decreasing signs, treatment effect on quality of life, and its effect on consent from sexual life, were significantly different between groups, and the first group which were treated by pessary method, had more satisfying results in comparison to other groups. On the other hand,though reducing the frequency of vaginal sound and the effect of treatment on the patient and patient's partner was better in the first group than other groups, there was no significant difference between groups. The above findings, in total, indicate that patients with vaginal sound complain had higher satisfaction in the first group which were treated by pessary method. In the other side, regarding the ease of this therapeutic method, and lack of complications of surgical procedure, this finding was already expected by the researchers.

However, in this study, no finding were found about the significant effect of weight, type of parturition, and duration of treatment in comparing different therapeutic methods. Though, age of patients were significantly higher in the first group in comparison to other ones. Also, number of menopaused women were significantly higher in this group.

Not only few number of studies evaluated this problem, but also most of them easily assessed the prevalence of problem and its risk factors, which are discussed below:

The study of Slieker-ton Hove and colleagues (2009), assessed the prevalence, complains, and risk factors of vaginal sound, in 2921 women which were 45-85 years old. In this study, vaginal sound introduced to be a result of pelvic floor disorder, and its risk factors were pelvic prolapse and parity. Prevalence of vaginal sound were 12.8% that 72.1% of patients reported to have few complaints from this problem. (Slieker-ten Hove *et al.*, 2009) In contradictory to our study, they did not consider therapeutic method. On the other hand, an attractive issue was that most of patients with vaginal sound, had few complaints from their status and did not follow their treatment. Whereas, in our study, 3 therapeutic methods were proposed for the patients and all patients had many complains of vaginal sounds, which makes them embrace in house or outside environment. Also, in this study, the median parity of patients was 2, and no separation were performed for normal or cesarean parturition, and this rate is less than our results.

In another study, performed by Krissi and colleagues (2003), risk factors and treatments of vaginal sounds assessed in 6 patients with this problem. Mean age of patients was 32.8±9.9, which is significantly lower than mean age of our patients. In this study, in contradictory with our study, BMI index is used instead of weight of patients to assess the effect of treatment. All patients were menopaused and 5 patients had history of parturition. The main therapeutic method which were used for these patients were pessary and 2 patients reported that their symptoms are cured after treatment. In this study, physiotherapy andpessary were used in all patients which its results were similar to us, and effect ofpessary method was significantly higher than other method. In this study, using pessary method is recommended for patients with vaginal sound.

In another study, performed by Veisi and colleagues (2012), a 1000 cases population included 18 to 80 years old women in Kermanshah were evaluated for risk factors of vaginal sound and its prevalence. The prevalence of vaginal sound in this population were reported to be 20% from which, embracement for the symptoms were only reported by 5.7%. (Veisi *et al.*, 2012) However, in contradictory with our study, 4% of the studied population were virgin and had no history of sexual intercourse; while our studied population was consisted of married women. Similar to our study, most of their patients with vaginal sound (71%) had natural parturition, and in few numbers of them, this problem occurred after caesarian parturition. However, it was reported that vaginal sound was occurred spontaneously in some cases (34%). On the other hand, similar to our results, the most frequent time that patients had problem with vaginal sound was during sexual intercourse (54%). However, patients expressed that most of their complain and embracement occurs during daily activities. In contradictory with our study, age and BMI in patients with this problem, were significantly lower than normal population. Also, prolapse degree in the patients was lower than normal population, which was not in concordance with our results.

All of mentioned findings including various risk factors that lead to the vaginal sound, indicate that it is impossible to considered a special risk factor to be the main cause for occurrence of vaginal sound.

Based on a review written by Neels and colleagues (2017), vaginal flatulence occurs during sexual intercourse or after that. Prevalence of the disease differs from 1% to 96% in different studies; however, pathophysiology and cause of the disease is not clear. Similar to our results, the highest correlation was reported between natural parturition and this disorder. Also, urinary incontinence was reported in

these patients which also were seen in our study (86% of patients in our study had degrees of urinary incontinence along with dyspareunia. Vaginal sound was reported to occur during sexual intercourse, exercise and daily activities, which were similar to our results. This problem often results to decrease in sexual activity and quality of life of patients. However, in this study it was mentioned that as there is no certain treatment for the patients, more researches and a better understanding of the disease is needed.

In the study of Jennine and colleagues (2015) that performed on 132 women in USA, 59 cases had pelvic floor disorder or pop. Due to this assessment, 69% had vaginal sound and 95% had the symptoms during sexual intercourse, which was higher than our results and in consistent with it. Quality of life of this patients was 22% lower than other studies. Prevalence of vaginal sound in patients with pelvic floor disorders was high. In this study, patients expressed to have vaginal sound, at least twice a week, and women which had this sign, had a significantly lower age mean in comparison to others. (Miranne *et al.*, 2015) In our study, also the frequency of vaginal sound occurrence was often monthly and/or weekly.

Conclusion

Our results indicated the effect of natural parturition on prevalence of vaginal sound. On the other hand, the vaginal sound mostly were occurred during sexual intercourse. Most of studied patients were also complained of urinary incontinence and dyspareunia. However, no treatment were more effective than others in decreasing symptoms. Between three therapeutic method, usingpessary was better than others and had a significant effect on improving sexual intercourse and quality of life. Although this treatment was insignificant, had a better effect on improving consent of patient's partner and in daily life of patients. In further studies, despite limiting therapeutic choices to one or two methods (pessary and physiotherapy), evaluation of potential risk factors and causes of the disease in women will be assessed. So, it will be possible to know the effect of other causes such as BMI on prevalence of diseases.

Thanking

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