Arch Gynecol Obstet (2016) 293:1263–1269
DOI 10.1007/s00404-015-3965-x

GENERAL GYNECOLOGY

Pelvic floor muscle training for female urinary incontinence: Does it work?

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Received: 18 July 2015 / Accepted: 9 November 2015 / Published online: 21 November 2015

Abstract
Purpose Supervised pelvic floor muscle training in patients of stress and mixed urinary incontinence has been recommended. Our aim was to assess the utilisation and effectiveness of our supervised pelvic floor muscle training service and assess the impact of incontinence scores before physiotherapy on the subsequent results of physiotherapy.
Methods All 271 patients referred to physiotherapy for symptoms of incontinence filled out the International Consultation on Incontinence Modular Questionnaire-Female Lower Urinary Tract Symptoms before starting treatment. Depending on pelvic floor muscle assessment, plans for exercises and follow up were made. If the strength of pelvic floor muscles was poor, electrical stimulation was offered. If awareness of the pelvic floor muscle contraction was poor, bio feedback was offered. Group sessions and vaginal cones were also used. Depending on the response to the treatment; patients were either discharged, referred to Urogynaecology clinic or continued physiotherapy. All patients who were discharged or referred for surgery were given a post treatment questionnaire to fill out.
Results 79 (56 %) of 132 women with stress, 49 (51 %) of 98 with mixed and 27 (66 %) of 41 with urge incontinence reported successful control of symptoms (overall success 54 %). However, 65 % of women with incontinence scores of 0–5 before physiotherapy, 64 % with 6–10, 42 % with 11–15 and mere 28 % with 16–20 achieved success with physiotherapy. 27 (10 %) were lost to follow up.
Conclusion 1 in 2 women referred to physiotherapy for incontinence, achieved successful control of symptoms without the need for invasive investigations or surgery. However, poor incontinence scores before the start of physiotherapy is a poor prognostic indicator for success. 90 % women utilised the service.

Keywords Physiotherapy · Female urinary incontinence

Introduction

Urinary incontinence is a common problem in the general population, more frequent in women. However, it is not something women find easy to report. A review of 36 general population studies found that the prevalence of "any" incontinence varied between 25 and 45 % for women [1].

National Institute of Clinical Excellence has published guidance on management of Urinary incontinence in 2006 and has recommended offering to all patients of stress and mixed urinary incontinence, at least 3 months of supervised pelvic floor muscle training [2]. It does not qualify how much the supervision should be and whether the training should happen in groups or not. Biofeedback and Electrical nerve stimulation have not been recommended routinely except in patients who are unable to achieve pelvic floor muscle contraction, to aid motivation and adherence to therapy.

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Cochrane Review of studies comparing approaches to pelvic floor muscle training concluded in 2011 that even though it appeared that more health professional contact was better than less, there was insufficient evidence to be sure that self reported improvement was echoed in incontinence specific quality of life or more "objective" incontinence measures [3].

We wanted to assess the utilisation of our supervised pelvic floor muscle training service, while finding out their effectiveness in our local population. Therefore, we decided to do a retrospective study of women being referred to physiotherapy department for urinary incontinence. We were able to assess the impact of incontinence scores before the start of physiotherapy (i.e. severity of symptoms) on the subsequent success rates of physiotherapy.

Materials and methods

We did a retrospective review of 271 patients referred to physiotherapy between March 2010 and April 2013.

Patients suffering from incontinence were referred to the physiotherapy department by the General Practitioner, the doctors at the Urogynaecology/Gynaecology out-patient clinic or by other health professionals like musculoskeletal physiotherapists and midwives.

The patients, who were referred, were put on a waiting list and then sent a letter asking them to call and book an appointment at their own convenience. They were then sent an appointment confirmation letter along with the International Consultation on Incontinence Modular Questionnaire-Female Lower Urinary Tract Symptoms (ICIQ-FLUTS) and a 3 days bladder diary to fill out.

When the women arrived at their physiotherapy appointment, they were examined and graded for pelvic floor muscle strength by the modified Oxford Scale (Table 1).

Women were examined in supine position. Any prolapse or painful areas were noted. Pelvic floor assessment for strength, endurance, repetitions and ability to perform fast contractions was done. They were also assessed whether or not they have an automatic contraction with a cough, and whether they can perform a pre-contraction with a cough on instruction. If their technique was incorrect, they were taught the right technique.

Depending on the findings of the pelvic floor muscle assessment and levels of physical activity in each patient, they were given verbal and written instructions to follow a personalised plan of pelvic floor muscle exercises. The traditional rule of 10 i.e. count to 10 for 10 repetitions followed by 10 short squeezes was altered according to the Oxford score and they were usually asked to do the whole set at least 3 times a day.

Women were encouraged to use personal memory triggers like, while waiting for the kettle to boil, or when sitting down for a meal. They were able to use alarms and apps on their smartphones or use other visual reminders around the house like coloured sticky dots.

Functional training formed part of the pelvic floor treatment programmes. All patients with stress incontinence were taught to use "the knack" to brace with their pelvic floor against increases in intra-abdominal pressure. Patients who had enough pelvic floor muscle function on examination were taught to try and use their pelvic floor

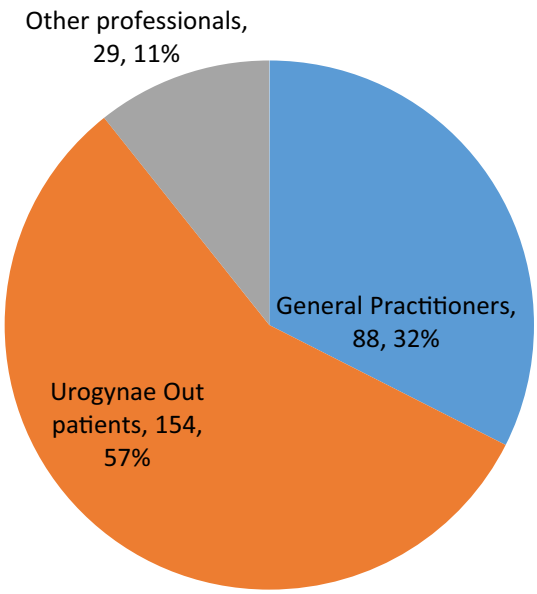


Fig. 1 Source of physiotherapy referral

Table 1 Oxford Scale for digital evaluation of pelvic floor contraction strength

Score	Findings
0	Nil
1	Flicker of muscle contraction
2	Weak contraction
3	Medium: slight lift of examiner's finger, no resistance
4	Strong: elevation of examiner's finger against light resistance
5	Very strong: elevation of examiner's finger against strong resistance

functionally, where possible, on activities that might cause leakage, e.g. trial submaximal contractions when walking. This advice is provided in addition to a specific, progressive pelvic floor muscle exercise program based on findings of a vaginal examination.

Women with urge incontinence too had pelvic floor assessment but additionally were provided with bladder retraining programme and advice on life style changes.

Women were usually offered another appointment within 3–4 weeks to ensure there is progress being made in terms of being able to do the exercises using the correct technique. This would require another examination if the technique was not correct at the first assessment. Quite naturally, this is to a large extent patient driven. Some women attended every 3–4 weeks, whereas others wanted to attend only after 6 weeks.

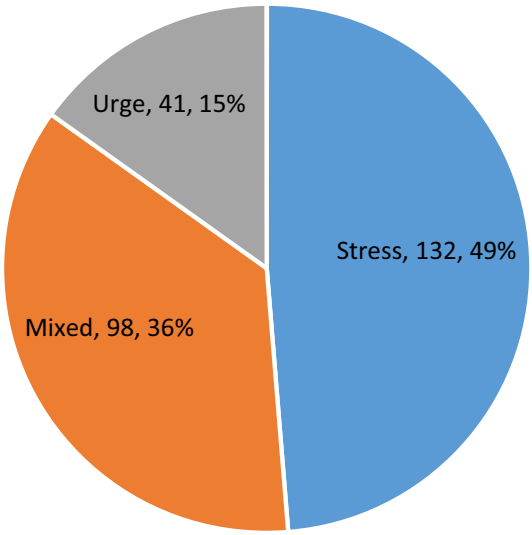


Fig. 2 Predominant symptoms

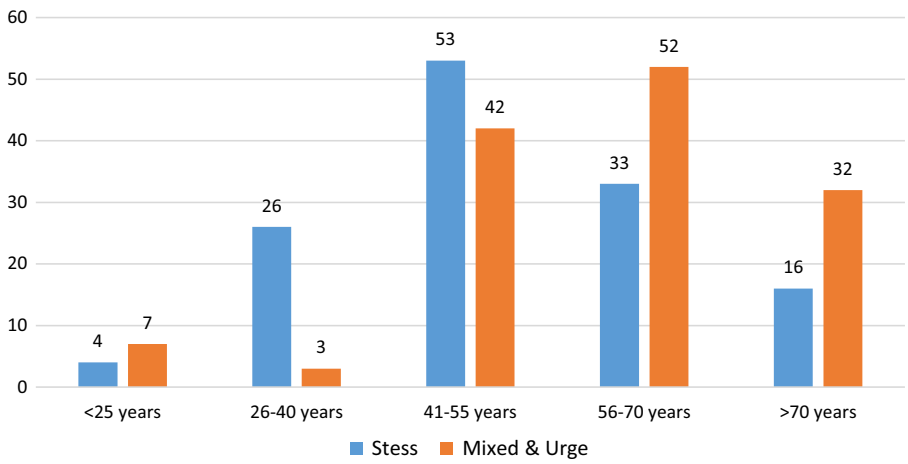
If the initial assessment of the strength of pelvic floor muscles was very poor then they were offered electrical stimulation straightaway, which would be a set of 6 sessions. If the strength is good but awareness of the pelvic floor muscle contraction poor, biofeedback was offered. Myomed 932, used for both electrical stimulation and electromyography biofeedback. A periform intravaginal electrode was used with patients in a crook lie position. A smaller anuform electrode may have been used intravaginally for some patients with a very narrow introitus. The frequency used was 35–40 Hz with pulse width of 360 ms. On average, no more than 35 duty cycles were used in 1 session. Each duty cycle was set according to the patients level of muscle function e.g. 4 s work phase with at least double rest phase.

Aquaflex weighted vaginal cones were offered in patients found suitable for them after the assessment. Patients were advised to use them for no more than 15–30 min per day, and to use them functionally e.g. when getting ready for work in the morning. Advised to progress weight gradually (starting weight was individually set dependent on findings of vaginal examination), starting with larger cone and progressing to smaller cone.

Hour long group sessions were offered too. Patients attended for a total of 6, once weekly sessions. Maximum of 8 patients per group, led by a qualified physiotherapist. Exercises focussed on pelvic floor muscle contractions integrated into Pilates-type exercises.

Depending on the response to the treatment and relief from symptoms; patients either opted to be discharged, or were referred to Urogynaecology clinic for surgery or further management or continued to attend appointments at the physiotherapy department to keep motivated. A significant number who presumably, either saw improvement in their symptoms or did not want to be referred to surgery, were lost to follow up. All patients who were discharged or

Fig. 3 Age distribution



referred for surgery were given a post treatment questionnaire to fill out.

Results

A total of 271 patients were seen between March 2010 and April 2013. 88 (32 %) were referred by the General Practitioners, 154 (57 %) were referred from the Urogynaecology/Gynaecology outpatient clinics, 29 (11 %) were referred by other professionals like midwives, other musculoskeletal physiotherapists, incontinence advisors etc. (Fig. 1). 132 (49 %) patients were referred for predominant symptoms suggestive of stress incontinence, 98 (36 %) for mixed incontinence and 41 (15 %) for urge incontinence (Fig. 2).

The maximum number of patients in the stress incontinence group were 41–55 years in age (40 %), whereas for the urge and mixed incontinence group the maximum number of patients were 56–70 years old (37 %). There were 11 patients who were under 25 years of age, 7 of whom had urge or mixed incontinence and 4 were referred for stress incontinence (Fig. 3).

Not unexpectedly, most women referred for physiotherapy for incontinence were multiparous but we did have 5 nulliparous women referred with symptoms of stress incontinence and 23 nulliparous women with symptoms of mixed and urge incontinence.

72 (56 %) women, referred for stress incontinence were referred back to the community, having successfully achieved significant control of their symptoms. 34 (26 %) were referred to Urogynaecology clinic for further management, possibly surgery. 4 (3 %) women did not want any intervention hence were not referred to Urogynaecology clinic. 16 (13 %) were lost to follow up and 3 (2 %) were as per their choice still undergoing physiotherapy (Fig. 4).

49 (51 %) women, referred for mixed incontinence were referred back to the community, having successfully achieved significant control of their symptoms. 28 (29 %) were referred back to Urogynaecology clinic, when they would have been referred for Urodynamics. 4 (4 %) women did not want to be referred back to the clinic for

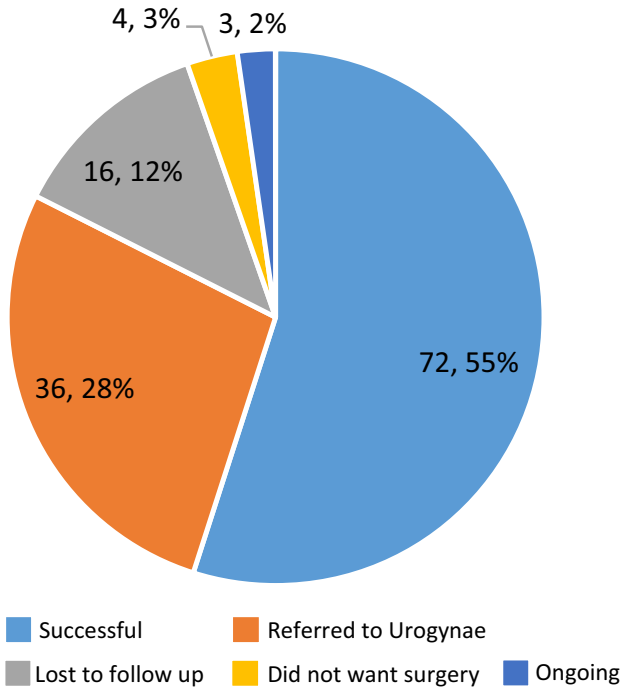
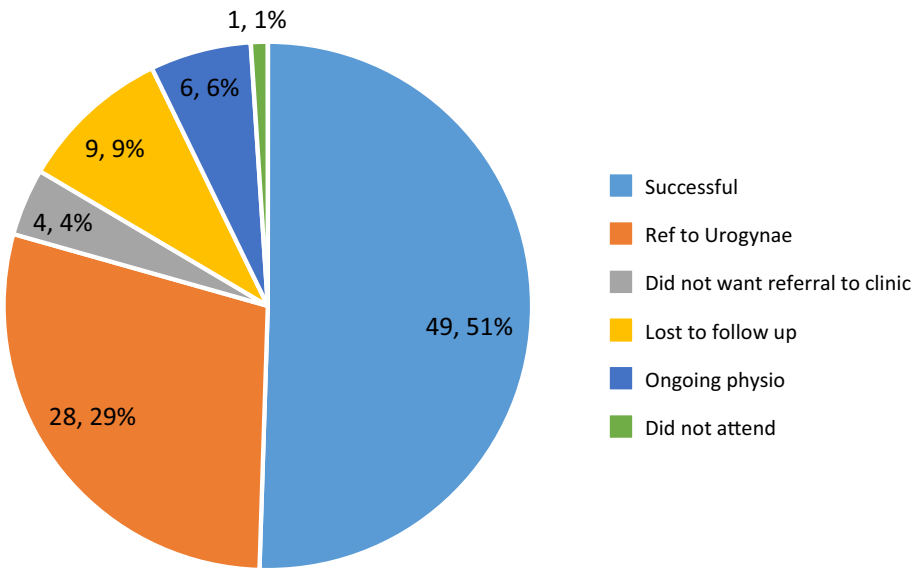


Fig. 4 Stress-outcomes

Fig. 5 Mixed-outcomes



any further treatment. 9 (9 %) were lost to follow up. 6 (6 %) were by choice still undergoing physiotherapy and 1 patient did not attend for physiotherapy (Fig. 5).

In the urge incontinence group 27 (66 %) were referred back to community having achieved significant control of symptoms, 7 (17 %) were referred to Urogynaecology clinic, 2 (5 %) did not want to be referred to Urogynaecology clinic for further management, 2 (5 %) were lost to follow up and 3 (7 %) were still undergoing physiotherapy as that is what they chose to do (Fig. 6).

All patients filled out ICIQ-FUTS Questionnaire (A research tool validated by the International Consultation on Incontinence, it has a set of 12 questions, 4 on filling, 3 on voiding and 5 on incontinence and gives scores of 0–4 for each question, thus the maximum score for incontinence is 20) before starting physiotherapy but only 115 (42 %) returned questionnaires after undergoing physiotherapy.

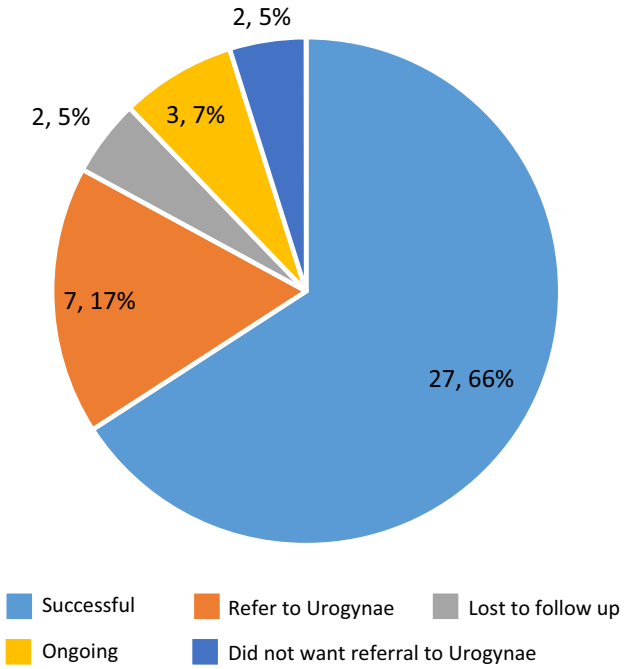


Fig. 6 Urge-outcomes

A successful outcome was when patients reported significant improvement in symptoms of incontinence and therefore were referred back to community. This occurred in 65 % of women who had an I score before physiotherapy of 0–5, 64 % in women with I score of 6–10, 42 % in women with I score between 11 and 15 and just 28 % in women with I scores of 16–20 before start of physiotherapy (Fig. 7).

66 % of women who achieved self reported successful control of incontinence symptoms needed between 1 and 4 individual instruction sessions as did 71 % of women who did not achieve desired result with physiotherapy and were either referred to Urogynaecology clinic or decided they did not want to be referred for further management. 24 % of women whose physiotherapy sessions were met with success underwent 5–8 individual instruction sessions, 0.07 % needed 9–12 sessions and only 3 women had more than 13 sessions. Of those women who did not achieve significant control of their symptoms, again 25 % of them needed 5–8 individual instruction sessions, 0.04 % needed 9–12 sessions, none had more. Therefore, the number of sessions attended were similar in both groups, those who achieved success and those who did not (Fig. 8).

Other modalities used were group sessions in 20 patients, vaginal cones in 5, electrical stimulation in 65 and biofeedback in 53 patients. Success rate of group sessions was good at 80 %, 60 % patients using vaginal cones achieved self-reported successful control of symptoms. The success rate was 46 % for electrical stimulation and 41 % for biofeedback (Fig. 9).

We also looked at the percentage of patients who had history of having had previous surgery. The percentage of women who had surgery and the type of surgeries they had, was similar in both groups, the group which had a successful

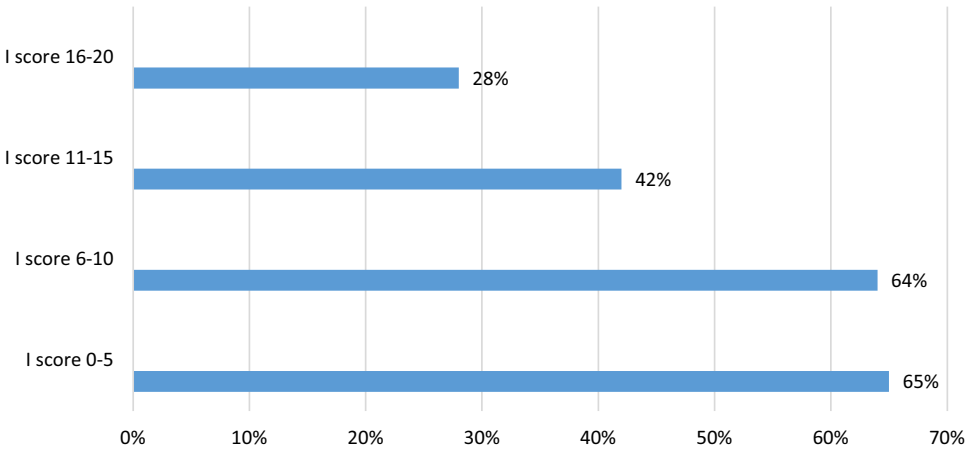


Fig. 7 Increasing incontinence scores and dropping success

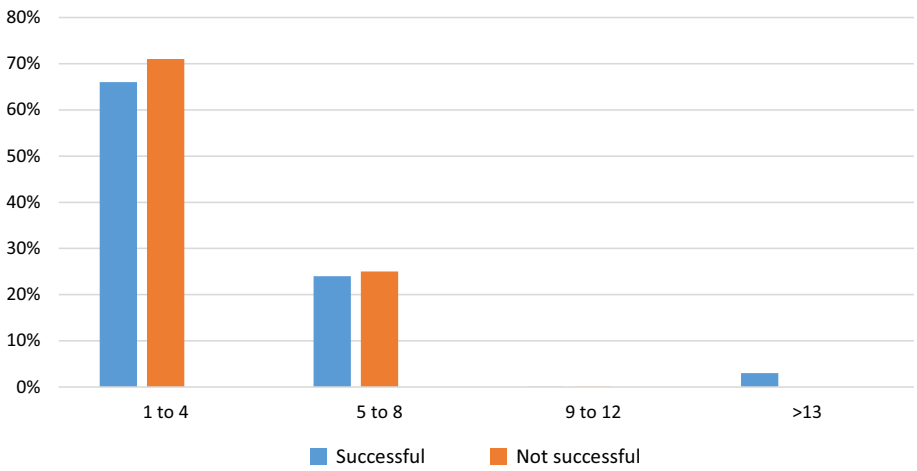


Fig. 8 Individual instruction sessions

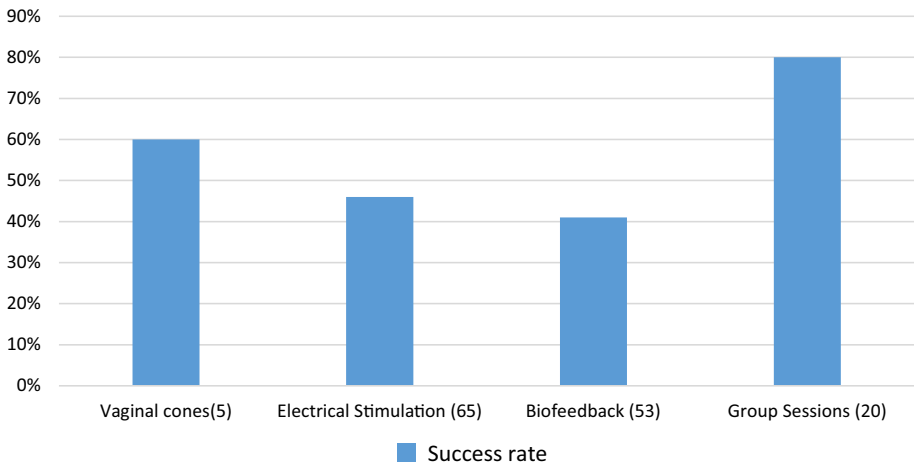


Fig. 9 Success rate

outcome with physiotherapy (36 %) and the group which did not (38 %). Maximum number of surgeries were hysterectomies and lesser percentage of prolapse repairs and a few mid urethral sling operations in each group.

Discussion

Overall success rate of physiotherapy in controlling symptoms of Urinary Incontinence was an encouraging 54 % (Fig. 10).

The poor prognostic indicators identified by a small study with 267 patients over 12 weeks has shown that poor recovery was associated with women with severe stress urinary incontinence, POP-Q stage >II, poor outcome of physiotherapy intervention for a previous urinary incontinence episode, prolonged second stage of labour, BMI >30, high psychological distress, and poor physical health [4].

Severe stress urinary incontinence as suggested by high Incontinence scores in our patients before physiotherapy has been a poor prognostic indicator in this study too.

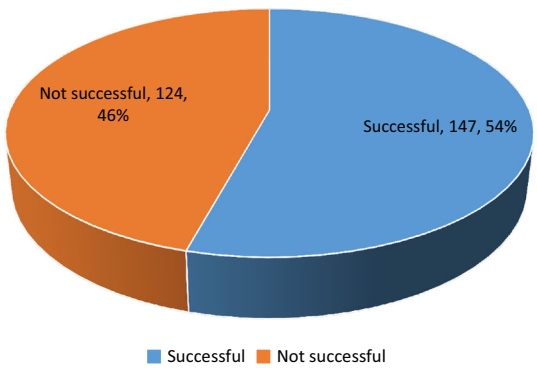


Fig. 10 Success of physio

We did not record the BMI of the patients presenting for physiotherapy as there were no facilities to do so. However, the percentage of women with booking BMI more than 30 in our antenatal clinics has consistently been increasing and has been 22, 23 and 24 % in the past 3 years. Even though this is not representative of the

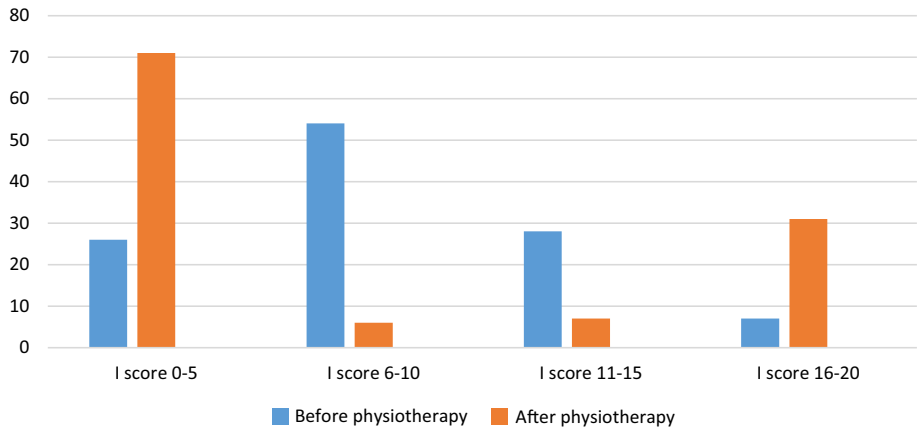


Fig. 11 Change in I scores after physiotherapy in 115 who returned questionnaires

population suffering from incontinence, considering how much childbirth plays a role, it is at least reflective.

We were able to compare I scores of 115 women who returned questionnaires after physiotherapy. While before physiotherapy, 23 % patients had lowest I scores of 0–5, after physiotherapy, 61 % patients had the lowest I score of 0–5. There was significant reduction in women having scores between 6 and 15; from 71 % of patients to 11 %. However the highest score of 16–20 actually had an increase from 0.06 to 27 % (Fig. 11).

Why I scores would become worse after physiotherapy is not entirely explained especially because only 18 % of the group of patients who returned questionnaires (115) were not deemed to have had a successful outcome after physiotherapy, yet 27 % had the highest Incontinence scores.

The success rate of physiotherapy in patients who returned questionnaires was reported to be significantly higher, 95 (82 %) as compared to those who did not 52 (33 %). This could be because the women were asked to fill out the questionnaire by the physiotherapists in the clinic and the patients felt obliged to report a favourable outcome. There were no objective measures to compare this result with. In this instance it does seem like a few patients reported successful control of symptoms verbally but put down worsening incontinence scores in the questionnaire they returned to us.

Conclusion

1 in 2 women referred to physiotherapy for incontinence, achieved successful control of symptoms without the need for invasive investigations or surgery. However, poor incontinence scores before the start of physiotherapy is a poor prognostic indicator for success. 90 % women engage and utilise the service.

Pelvic floor muscle training, the initial assessment, the frequency and timing of follow up sessions and the choice of more intense forms of therapy has to be individualised and tailored dependant on pelvic floor muscle strength, the adherence and motivation of the women apart from patient choice for certain modalities like group sessions or vaginal cones. NICE guidance recommendation for a conservative mode of management before surgery does have benefits for patients by improving symptom control and allowing them to avoid surgical interventions.

Compliance with ethical standards

Conflict of interest No conflict of interest to declare.

References

1. Milsom I (2009) Lower urinary tract symptoms in women. Curr Opin Urol 19(4):337–341
2. National Institute of Health and Care Excellence Guideline (2013) The management of urinary incontinence in women
3. Hay-Smith EJ, Herderschee R, Dumoulin C, Herbison GP (2011) Comparisons of approaches to pelvic floor muscle training for urinary incontinence in women. Cochrane Database Syst Rev. doi:10.1002/14651858.CD009508
4. Hendricks EJM et al (2009) Prognostic indicators of poor short term outcome of physiotherapy intervention in women with stress urinary incontinence. Neurol Urodyn 29(3):336–343