

论著·临床研究

产后盆底肌训练对改善盆底功能的效果分析

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[摘要] **目的**·评价产后1年内盆底肌训练(Kegel训练)对产妇盆底功能康复的作用。**方法**·选取2020年1—4月在上海交通大学医学院附属国际和平妇幼保健院产后6周检查有不同程度尿失禁和/或盆腔器官脱垂的阴道分娩初产妇,分为锻炼组(147例)和对照组(194例)。锻炼组于产后6周开始进行Kegel训练,对照组进行一般的产后健康教育。在产后6周及产后1年,对2组产妇进行一般情况问卷及国际尿失禁咨询委员会尿失禁问卷表简表(International Consultation Incontinence Questionnaire-UI Short Form, ICIQ-SF)调查,并进行盆底肌力测定和分级(盆底肌力分级>Ⅲ级表明肌力正常);根据盆腔器官脱垂分度法(pelvic organ prolapsed quantitation, POP-Q)定量评估脱垂程度。比较2组产妇的盆底肌力分级、尿失禁评分以及盆腔器官脱垂情况,评价盆底肌训练的效果。**结果**·随访至产后1年,锻炼组和对照组失访数分别为20例和28例。锻炼组产后1年盆底肌力正常的比例显著高于产后6周(56.0% vs 34.7%, $P=0.000$),尿失禁发生率显著低于产后6周(25.2% vs 36.7%, $P=0.040$)。对照组产后1年盆底肌力正常的比例显著高于产后6周(43.4% vs 32.5%, $P=0.033$),尿失禁发生率显著低于产后6周(17.5% vs 28.9%, $P=0.011$)。产后1年,锻炼组盆底肌力正常的比例高于对照组(56.0% vs 43.4%, $P=0.033$),盆底肌力好转率高于对照组(50.4% vs 35.5%, $P=0.011$)。盆腔器官脱垂程度改善率和尿失禁好转率在锻炼组和对照组之间分别比较,差异均无统计学意义($P>0.05$)。**结论**·产后进行盆底肌训练可提高盆底肌力,但对改善产妇盆底功能障碍的效果并不明显;产后1年产妇尿失禁和盆底肌力均有改善,表明盆底肌有自行恢复的机制,但可能需要较长的时间。

[关键词] 盆底肌训练; 产后; 尿失禁; 盆腔器官脱垂; 盆底肌; 自然分娩

[DOI] 10.3969/j.issn.1674-8115.2023.03.006 **[中图分类号]** R711.2 **[文献标志码]** A

Effect of postpartum pelvic floor muscle training on improving pelvic floor function

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[Abstract] **Objective**·To evaluate the effect of pelvic floor muscle training (Kegel training) on the rehabilitation of pelvic floor function within 1 year after delivery. **Methods**·From January to April 2020, primiparas with different degrees of urinary incontinence or pelvic organ prolapse were selected and divided into exercise group (147 cases) and control group (194 cases). The exercise group received Kegel training at 6 weeks of the postpartum period, while the control group received general postpartum health education only. At 6 weeks and 1 year after delivery, these postpartum women in the two groups were investigated with the general information questionnaire and International Consultation Incontinence Questionnaire-UI Short Form (ICIQ-SF). The pelvic floor muscle strength was measured (the pelvic floor muscle strength grade>Ⅲ indicates normal muscle strength). The pelvic organ prolapsed quantitation (POP-Q) score was assigned accordingly. The urinary incontinence score, pelvic floor muscle strength and pelvic floor organ prolapse were compared between the two groups, and the effect of pelvic floor muscle training was evaluated. **Results**·In the exercise group, 20 postpartum women lost contact during follow up sections, and 28 women in the control group were unable to be contacted within 1 year. In the exercise group, the proportion of women with normal pelvic floor muscle strength at 1 year postpartum was significantly higher than that at 6 weeks postpartum (56.0% vs 34.7%, $P=0.000$), and the incidence of incontinence at 1 year postpartum was significantly lower than that at 6 weeks postpartum (25.2% vs 36.7%, $P=0.040$). In the control group, the proportion of women with normal pelvic floor muscle strength at 1 year postpartum was significantly higher than that at 6 weeks postpartum (43.4% vs 32.5%, $P=0.033$), and the incidence of incontinence at 1 year postpartum was significantly lower than that at 6 weeks postpartum (17.5% vs 28.9%, $P=0.011$). At 1 year postpartum, the proportion of women with normal

[基金项目] 上海市卫生健康委员会卫生行业临床研究专项项目(202040232);上海市高水平地方高校创新团队(SHSMU-ZLCX20210202)。

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[Funding Information] Special Project of Clinical Research in Health Industry of Shanghai Municipal Health Commission (202040232); Innovative Research Team of High-Level Local Universities in Shanghai (SHSMU-ZLCX20210202)。

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pelvic floor muscle strength in the exercise group was higher than that in the control group (56.0% vs 43.4%, $P=0.033$). The improvement rate of muscle strength in the exercise group was higher than that in control group (50.4% vs 35.5%, $P=0.011$). There was no significant difference in the improvement rate of pelvic organ prolapse and frequency of urinary incontinence between the exercise group and the control group ($P>0.05$). **Conclusion** Postpartum pelvic floor muscle training can improve pelvic floor muscle strength, but has no significant effect on improving pelvic floor dysfunction in the current samples. The urinary incontinence condition and pelvic floor muscle strength of women improve 1 year after delivery, indicating that there is a mechanism for self recovery of pelvic floor muscle, but it may take a long time.

[Key words] pelvic floor muscle training; postpartum; urinary incontinence; pelvic organ prolapse; pelvic floor muscle; natural childbirth

盆底功能障碍性疾病 (pelvic floor dysfunction, PFD) 主要包括盆腔器官脱垂 (pelvic organ prolapse, POP) 和尿失禁 (urinary incontinence, UI), 是影响女性生活质量的常见病。妊娠和分娩是导致 PFD 的常见病因。有文献报道, 产后 UI 发病率可高达 30%^[1], 一半以上的产妇存在不同程度的 POP^[2-3]。妊娠分娩导致盆底肌功能受损可能是 UI 和 POP 发生的原因^[4]。产后盆底肌训练 (Kegel 训练) 被认为是产后 PFD 的一线治疗方法^[5], 但其对 PFD 是否具有改善作用目前仍不确定。国外已经开展了一些随机对照研究, 但结果不一致, 存在一定争议^[1,6-8]。WOODLEY 等^[1]认为, Kegel 训练对产后 UI 的治疗效果存在不确定性; SIGURDARDOTTIR 等^[8]的研究表明 Kegel 训练至产后 6 个月可显著改善产妇的 UI 情况, 但至产后 1 年效果不明显。在国内, 产后康复训练的研究多集中在电刺激生物反馈治疗方面, 但该疗法需要特殊设备, 且要求产妇反复前往医院治疗, 给哺乳期产妇带来不便; 此外, 该疗法还具有阴道炎或阴道出血等禁忌证。单纯 Kegel 训练具有便捷、经济、随时可进行的优势。本研究旨在探讨产后 1 年内行 Kegel 训练对产妇盆底功能康复的作用, 以期 PFD 产妇的康复训练提供依据。

1 对象与方法

1.1 研究对象

选取 2020 年 1—4 月在上海交通大学医学院附属国际和平妇幼保健院产后 6 周检查发现有不同程度 UI 和/或 POP 的阴道分娩初产妇作为研究对象。纳入标准: ① 足月、单胎。② 阴道分娩。③ 产后恶露已净。排除标准: ① 既往有引产史。② 合并慢性咳嗽、便秘、哮喘等内科疾病。③ 既往盆腔手术史。④ 孕前有 POP 和 UI 病史。⑤ 有Ⅲ度及Ⅲ度以上会阴裂伤。退出标准: ① 未完成随访中途退出或者信息不

全影响判断。② 中途采用其他物理治疗手段。③ 未达到训练标准强度。④ 再次妊娠。本研究在中国临床实验中心 (www.chictr.org.cn) 注册, 注册号: ChiCTR1800017354。

1.2 研究方法

1.2.1 研究分组 于产后 6 周常规检查时筛选存在 PFD 情况的产妇, 告知产妇可行 Kegel 训练治疗, 但效果有赖于长期观察, 且需坚持锻炼 1 年。将参加 Kegel 训练并坚持随访 1 年者, 入组为锻炼组; 将不参加 Kegel 训练、仅接受健康宣教者, 入组为对照组。对锻炼组产妇进行一对一的 Kegel 训练口头指导, 介绍训练目的、方法、注意事项, 观察和阴道触诊检查产妇盆底肌的收缩情况, 直至产妇完全掌握盆底肌训练的方法。告知产妇后续每周至少进行 3 d 的 Kegel 训练, 每日 3 次, 每次 15 min 或者 50 次盆底肌收缩, 收缩 1 次至少持续 5 s, 再放松 10 s; 并告知在行走、站立、坐位、卧位均可进行训练; 产妇每日记录训练日记并且每周在微信上传训练达标情况。为提高依从性, 由专人负责微信训练群的管理, 每周发布健康科普宣传, 提醒产妇进行盆底肌训练 3~6 个月后再复查康复情况, 并叮嘱其继续训练至产后 1 年。产妇如未达到训练要求 (每周至少 3 d, 每日至少 1 次 Kegel 训练^[8]) 则退出锻炼组。对照组在产后 6 周进行盆底功能筛查, 同时进行一般的 PFD 健康宣教, 后期不再干预。

1.2.2 观察指标 对入组对象在产后 6 周和产后 1 年评估以下指标。

(1) 盆底肌力检测分级 根据国际通用的会阴肌力测试法 (general report revised urinary grade, GRRUG), 由经过专科培训的 2 名医师进行临床查体并进行盆底肌力分级: 盆底肌收缩持续 0 s 为 0 级, 以此类推, 持续 5 s 或以上为 V 级; 其中 0~Ⅲ级为肌力异常, IV~V 级为肌力正常。

(2) 盆腔脏器的脱垂程度 由经过专科培训的2名医师进行临床查体, 根据盆腔器官脱垂分度法 (pelvic organ prolapsed quantitation, POP-Q) 定量评估脱垂程度。检查方法: 在安静环境下, 受试者排空膀胱后取膀胱截石位于妇科检查床, 嘱受试者做Valsalva动作 (屏气用力), 重复2次。

(3) 一般情况及UI评分 采用自编问卷, 调查产妇年龄、身高、体质量、文化程度、哺乳时间等基本情况; 根据国际尿失禁咨询委员会尿失禁问卷简表 (International Consultation Incontinence Questionnaire-UI Short Form, ICIQ-SF) 对UI情况进行评分。

1.3 统计学方法

采用SPSS 23.0软件进行数据处理。正态分布的定量资料以 $\bar{x} \pm s$ 表示, 组间比较采用两独立样本 t 检验; 非正态分布的定量资料以 $M(Q_1, Q_3)$ 表示, 组间比较采用Man-Whitney U 检验。定性资料以 $n(\%)$ 表示, 组间比较采用 χ^2 检验。 $P < 0.05$ 表示差异有统计学意义。

表1 2组产妇的一般情况比较

Tab 1 Comparison of baseline data between the two groups of postpartum women

Item	Exercise group ($n=147$)	Control group ($n=194$)	$t/Z/\chi^2$ value	P value
Age/year	30.35 \pm 3.15	29.95 \pm 3.21	1.164	0.245
Gestational length/week	39.01 \pm 1.15	39.11 \pm 1.02	-0.847	0.398
Pre-gestational BMI/($\text{kg} \cdot \text{m}^{-2}$)	20.54 \pm 2.17	20.34 \pm 2.24	0.818	0.414
Weight gain/kg	15.69 \pm 4.39	15.50 \pm 4.36	0.408	0.684
Neonatal birth weight/g	3 366.84 \pm 330.85	3 329.15 \pm 393.47	0.937	0.349
Duration of the second stage/min	50.00 (31.00, 81.00)	55.00 (30.00, 83.25)	-0.245	0.807
Breast-feeding time/month	9.69 \pm 3.38	9.68 \pm 3.52	0.034	0.973
Education/ $n(\%)$			0.003	0.999
Secondary education	9 (6.1)	12 (6.2)		
College or university	114 (77.6)	150 (77.3)		
Graduate	24 (16.3)	32 (16.5)		
Gravidity/ $n(\%)$			3.250	0.197
1	112 (76.2)	138 (71.1)		
2	24 (16.3)	46 (23.7)		
≥ 3	11 (7.5)	10 (5.2)		
Episiotomy/ $n(\%)$			1.416	0.234
Yes	40 (27.2)	42 (21.6)		
No	107 (72.8)	152 (78.4)		
Perineal laceration/ $n(\%)$			1.479	0.477
0	41 (27.9)	43 (22.1)		
I	84 (57.1)	120 (61.9)		
II	22 (15.0)	31 (16.0)		
Delivery mode/ $n(\%)$			0.514	0.473
Natural delivery	129 (87.8)	165 (85.1)		
Forceps	18 (12.2)	29 (14.9)		

2 结果

2.1 一般临床资料及产后6周产妇PFD情况比较

共纳入341例产妇, 其中锻炼组147例, 对照组194例。产后1年, 锻炼组共有20例退出研究, 包括14例未达到锻炼标准, 4例因在外地中途退出, 1例再次妊娠, 1例采用物理治疗; 对照组共有28例退出研究, 包括21例中途退出 (9例无法联系, 12例拒绝复诊), 2例再次妊娠, 3例采用物理治疗, 2例资料不全。锻炼组和对照组的失访率分别为13.6%和14.4%。2组产妇的年龄、分娩孕周、孕前体质量指数 (body mass index, BMI)、孕期增加体质量、新生儿出生体质量、第二产程时长、哺乳时间、文化程度、孕次、会阴侧切率、产钳助产率等指标比较, 差异均无统计学意义。结果见表1。

产后6周时, 比较2组产妇的POP程度、UI发生率、ICIQ-SF评分和盆底肌力强度, 其差异均无统计学意义 (表2)。

表2 产后6周时2组产妇PFD情况比较

Tab 2 Comparison of PFD at 6 weeks postpartum between the two groups

Parameter	Exercise group (n=147)	Control group (n=194)	χ^2/Z value	P value
POP stage/n (%)			5.414	0.067
Grade 0	23 (15.6)	36 (18.6)		
Grade 1	68 (46.3)	107 (55.1)		
Grade 2	56 (38.1)	51 (26.3)		
Muscle strength/n (%)			0.185	0.728
>Ⅲ	51 (34.7)	63 (32.5)		
≤Ⅲ	96 (65.3)	131 (67.5)		
UI/n (%)			2.370	0.124
No	93 (63.3)	138 (71.1)		
Yes	54 (36.7)	56 (28.9)		
ICIQ-SF score	0 (0, 4.00)	0 (0, 3.35)	-1.493	0.136

2.2 产后1年2组产妇PFD改善情况比较

产后1年时,锻炼组肌力正常(盆底肌力分级

>Ⅲ级)比例为56.0%,高于对照组的43.4%,2组间差异有统计学意义($P=0.033$);锻炼组肌力好转率为50.4%,高于对照组的35.5%,2组间差异有统计学意义($P=0.011$)。2组产妇之间POP-Q分度、POP好转率、UI发生率和ICIQ-SF评分,差异均无统计学意义($P>0.05$)。结果见表3。

2组产妇在产后6周和产后1年比较,盆底肌力随着时间的变化均显著提高,UI发生率也显著下降。锻炼组盆底肌力正常比例从产后6周的34.7%提高到产后1年的56.0%,前后比较差异有统计学意义($P=0.000$);UI发生率从产后6周的36.7%下降到产后1年的25.2%,前后比较差异有统计学意义($P=0.040$)。对照组盆底肌力正常比例从产后6周的32.5%提高到产后1年的43.4%,前后比较差异有统计学意义($P=0.033$);UI发生率从产后6周的28.9%下降到产后1年的17.5%,前后比较差异有统计学意义($P=0.011$)。结果见表4。

表3 产后1年2组产妇PFD改善情况比较

Tab 3 Change of PFD after 1 year postpartum between the two groups

Parameter	Exercise group (n=127)	Control group (n=166)	χ^2/Z value	P value
POP stage change/n (%)			0.814	0.367
Better	30 (23.6)	32 (19.3)		
No better	97 (76.4)	134 (80.7)		
POP stage/n (%)			0.933	0.627
Grade 0	19 (15.0)	32 (19.3)		
Grade 1	67 (52.8)	83 (50.0)		
Grade 2	41 (32.2)	51 (30.7)		
Muscle strength/n (%)			4.523	0.033
>Ⅲ	71 (56.0)	72 (43.4)		
≤Ⅲ	56 (44.0)	94 (56.6)		
Muscle strength change/n (%)			6.516	0.011
Better	64 (50.4)	59 (35.5)		
No better	63 (49.6)	107 (64.5)		
UI/n (%)			2.606	0.106
No	95 (74.8)	137 (82.5)		
Yes	32 (25.2)	29 (17.5)		
ICIQ-SF score	0 (0, 3.00)	0 (0, 2.00)	-1.730	0.084

表4 2组产后6周和产后1年PFD情况比较

Tab 4 Comparison of PFD between 6 weeks and 1 year postpartum in the two groups

Parameter	Exercise group				Control group			
	6 weeks postpartum (n=147)	1 year postpartum (n=127)	χ^2 value	P value	6 weeks postpartum (n=194)	1 year postpartum (n=166)	χ^2 value	P value
POP stage/n (%)			1.255	0.534			1.096	0.578
Grade 0	23 (15.6)	19 (15.0)			36 (18.6)	32 (19.3)		
Grade 1	68 (46.3)	67 (52.8)			107 (55.1)	83 (50.0)		

Continued Tab

Parameter	Exercise group				Control group			
	6 weeks postpartum (n=147)	1 year postpartum (n=127)	χ^2 value	P value	6 weeks postpartum (n=194)	1 year postpartum (n=166)	χ^2 value	P value
Grade 2	56 (38.1)	41 (32.2)			51 (26.3)	51 (30.7)		
Muscle strength/n (%)			12.411	0.000			4.534	0.033
>Ⅲ	51 (34.7)	71 (56.0)			63 (32.5)	72 (43.4)		
≤Ⅲ	96 (65.3)	56 (44.0)			131 (67.5)	94 (56.6)		
UI/n (%)			4.212	0.040			6.441	0.011
No	93 (63.3)	95 (74.8)			138 (71.1)	137 (82.5)		
Yes	54 (36.7)	32 (25.2)			56 (28.9)	29 (17.5)		

3 讨论

1948年美国妇产科医师KEGEL提出Kegel训练法,最初报道利用该方法治愈了64例UI患者^[9]。此后该治疗手段逐渐被推广到包括POP在内的所有PFD患者。对于Kegel训练的效果已经有较多的前瞻性研究,但结论却存在很大争议^[1,6-8]。其中患者依从性差和训练强度不一致可能是导致不同研究结果差异较大的原因。有报道^[8]显示只有26%的产妇在产后1年仍能坚持每周3d的提肛运动。本研究采用微信群模式管理锻炼组^[10],每日提醒产妇锻炼,这种密切的联系与沟通能较好地提高产妇的依从性;至产后1年每周坚持提肛运动3d的产妇达到86.4%(127/147),且失访率较低。为避免样本偏差导致数据误差,本研究未纳入未达到锻炼标准次数及锻炼量的产妇,从而保证锻炼组产妇均为Kegel训练达标者,以减少案例偏差的影响。

既往有研究^[11-12]表明,盆底肌锻炼可改善产后UI症状。而一项meta分析^[1]提示,产后盆底肌训练对产后6~12个月UI的改善作用不明显。也有研究^[8]认为盆底肌锻炼在产后6个月内对UI的改善有显著作用,但是随访到产后12个月未见明显作用,原因可能是随着时间的推移能够持续进行提肛运动的产妇数量显著下降。本研究结果显示,锻炼组和对照组比较,UI发生率和ICIQ-SF评分差异均无统计学意义,提示Kegel训练在本研究中未能显著改善UI的情况,其原因有待后续研究进一步探讨。未来仍需要更科学地确定产妇执行Kegel训练的强度、密度、依从性。此外,因考虑到产后6个月内产妇较繁忙,可能导致随访困难,故本研究未在产后6个月内进行随访。

一些对非孕产妇POP患者的研究^[13-14]结果提

示,盆底肌锻炼可改善脱垂相关功能症状,对POP-Q分度的改善也有作用。但是一项多中心随机对照研究^[15]表明,盆底肌锻炼只能改善症状,对POP的解剖复位的作用并不明显。虽然一些对中老年POP患者的研究^[15]表明提肛运动可以改善脱垂症状,但是这不一定适用于孕产妇。国外学者对产妇POP的研究^[6-7,16]结果显示,提肛运动对改善脱垂症状和POP-Q分度均无明显效果。本研究也获得了同样的结果,即产后12个月锻炼组和对照组之间脱垂程度好转率和POP-Q分度差异均无统计学意义。产妇在养育照看婴儿的过程中可能产生诸多躯体和精神症状,这些可能混淆脱垂引起的症状,并且轻度脱垂通常也无症状,故本研究未对POP症状进行调查比较。笔者认为提肛运动主要是锻炼盆底肌,提高肌力强度,而POP是黏膜、肌肉、筋膜、韧带等多种组织过度牵拉所致,单纯提高盆底肌强度可能并不能达到治疗PFD的效果。

目前多项研究^[7-8,11,17]提示通过盆底肌训练可以提高盆底肌肌力强度。本研究也得出了相似的结论,显示锻炼组盆底肌力改善情况明显好于对照组。值得一提的是,本研究结果显示2组产妇产后1年盆底肌力均有显著提高,UI发生率均显著减低,与既往研究^[18-19]结果一致;这提示盆底肌可能有自行恢复的机制,部分存在UI和盆底肌力较弱的产妇在产后1年相关症状也可自行恢复。该康复机制是否与孕产次、年龄、失禁程度、盆底肌强弱及Kegel训练强度和密度有关,还需进一步大样本研究。

本研究不足之处在于非随机对照研究,可能存在选择上的偏倚,也缺少更多时间点的随访。产后盆底肌训练是无侵入性且经济的操作,是产后骨盆底肌复原的首选方式,但其对初产妇及经产妇PFD的治疗

效果及 Kegel 训练干预所需的有效剂量还需要多中心、大样本的随机对照研究继续探讨。

利益冲突声明/Conflict of Interests

所有作者声明不存在利益冲突。

All authors disclose no relevant conflict of interests.

伦理批准和知情同意/Ethics Approval and Patient Consent

本研究涉及的所有试验均已通过上海交通大学医学院附属国际和平妇幼保健院伦理审查委员会的审核批准(文件号 GKLW2020-110)。所有试验过程均严格遵守相关法律法规和国际伦理准则进行。受试对象已经签署知情同意书。

All experimental protocols in this study were reviewed and approved by the International Peace Maternity & Child Health Hospital Ethics Committee, Shanghai Jiao Tong University School of Medicine (Approval

Letter No. GKLW2020-110), and all experimental protocols were carried out by following relevant laws, regulations and international ethical guidelines. Consent letters have been signed by the research participants.

作者贡献/Authors' Contributions

饶琳、卢邦春负责研究设计、论文写作和修改,张琳娜、袁嘉琪、卢邦春负责产妇随访、数据整理以及统计。所有作者均阅读并同意了最终稿件的提交。

RAO Lin and LU Bangchun participated in the design of the study, writing and revision of the manuscript. ZHANG Linna, YUAN Jiaqi and LU Bangchun participated in maternal follow-up, data collection and statistics. All the authors have read the last version of paper and consented for submission.

• Received: 2022-12-12

• Accepted: 2023-03-09

• Published online: 2023-03-28

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[本文编辑] 崔黎明

