High-intensity focused ultrasound (HIFU) ablation versus surgical interventions for the treatment of symptomatic uterine fibroids: a systematic review and meta-analysis

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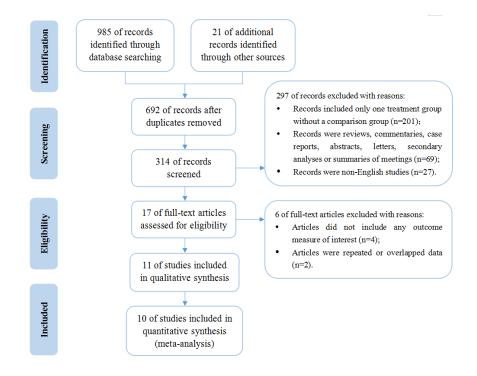
Abstract

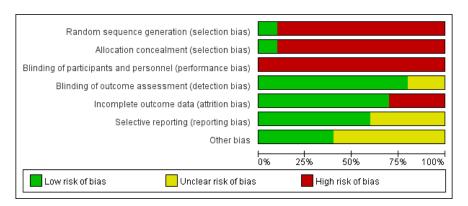
Objective The purpose of this meta-analysis was to compare the effectiveness and safety of HIFU with surgical interventions for the treatment of symptomatic uterine fibroids in women according to the studies available in current literature. Main results A total of 10 studies involving 4450 women were included in our meta-analysis. Compared with surgery group, the reduction of uterine fibroid symptom (UFS) scores at 6- and 12-month follow-up were higher in HIFU group, with the overall MD -4.16 (95% CI, -7.39 to -0.94, P=0.01) and -2.44 (95% CI, -3.67 to -1.20, P=0.0001), respectively. The increase of quality-of-life (QoL) scores at 6- and 12-month follow-up were also higher in HIFU group, with the overall MD 2.13 (95% CI, 0.86 to 3.14, P=0.001) and 2.34 (95% CI, 0.82 to 3.85, P=0.003), respectively. Both of the duration of hospital stay and the time to return to work was significantly shorter in HIFU group, with the overall MD -3.41 (95% CI, -5.11 to -1.70, P<0.0001) and -11.61 (95% CI, -19.73 to -3.50, P=0.005), respectively. The incidence of significant complications was significantly lower in HIFU group, with the overall RR 0.33 (95% CI, 0.13 to 0.81, P=0.02). The difference of incidence of adverse events, effective rate, symptom recurrence rate, re-intervention rate and pregnancy rate between HIFU and surgery were not statistically significant. Conclusion Compared with surgical interventions, HIFU ablation therapy leads to more significant alleviation of symptoms and improvement of QoL, quicker postoperative recovery and fewer significant complications.

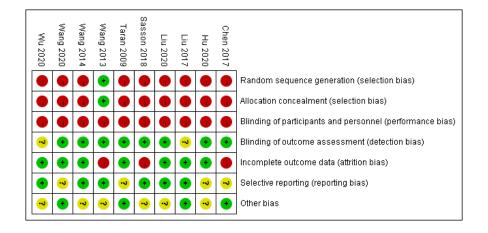
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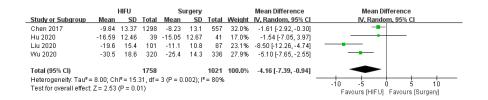
HIFU20201017.pdf available at https://authorea.com/users/368380/articles/487524-high-intensity-focused-ultrasound-hifu-ablation-versus-surgical-interventions-for-the-treatment-of-symptomatic-uterine-fibroids-a-systematic-review-and-meta-analysis

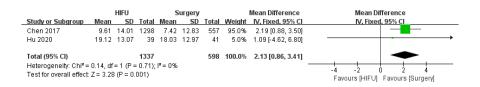
- #1 Leiomyoma [Mesh]
- #2 *myomas [Title/Abstract]) OR (fibroid*[Title/Abstract]
- #3 High-Intensity Focused Ultrasound Ablation [Mesh]
- #4 focused ultrasound [Title/Abstract] OR HIFU [Title/Abstract] OR MRgFUS [Title/Abstract]
- #5 surgery [Title/Abstract] OR hysterectomy [Title/Abstract] OR myomectomy [Title/Abstract]
- #6 #1 OR #2
- #7 #3 OR #4
- #8 #6 AND #7 AND #5











		HIFU		Sı	ırgery			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Chen 2017	3.6	3.2	1353	9.7	3.2	1058	20.3%	-6.10 [-6.36, -5.84]	•
Hu 2020	2.56	0.98	39	3.31	0.6	42	20.2%	-0.75 [-1.11, -0.39]	
Liu 2017	3.86	1.25	99	7.49	2.34	67	19.9%	-3.63 [-4.24, -3.02]	
Wang 2013	1.25	0.1	60	4.5	0.42	60	20.4%	-3.25 [-3.36, -3.14]	•
Wang 2014	2.9	1.5	89	6.2	2.7	41	19.3%	-3.30 [-4.18, -2.42]	
Total (95% CI)			1640			1268	100.0%	-3.41 [-5.11, -1.70]	-
Heterogeneity: Tau ² :	= 3.72; C	-4 -2 0 2 4							
Test for overall effect	Z = 3.92	Favours [HIFU] Favours [Surgery]							

		HIFU		Si	urgery			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Chen 2017	4.1	3.1	1353	26.5	14.6	1058	25.0%	-22.40 [-23.30, -21.50]	*
Hu 2020	3.14	0.83	39	6.09	0.9	42	25.0%	-2.95 [-3.33, -2.57]	•
Taran 2009	2.7	0.9	109	17.4	1.1	83	25.1%	-14.70 [-14.99, -14.41]	•
Wang 2014	4.5	1.5	89	10.9	3.8	41	24.9%	-6.40 [-7.60, -5.20]	+
Total (95% CI)			1590			1224	100.0%	-11.61 [-19.73, -3.50]	
Heterogeneity: Tau ² =	68.44;	Chi²=	-20 -10 0 10 20						
Test for overall effect	Z = 2.80) (P = I	Favours [HIFU] Favours [Surgery]						

	HIFU Surgery			егу		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Taran 2009	14	109	33	83	42.8%	0.32 [0.19, 0.56]	-
Wang 2013	0	60	10	60	8.8%	0.05 [0.00, 0.79]	
Wang 2014	17	89	11	41	40.2%	0.71 [0.37, 1.38]	
Wang 2020	0	245	4	129	8.3%	0.06 [0.00, 1.08]	-
Total (95% CI)		503		313	100.0%	0.33 [0.13, 0.81]	•
Total events	31		58				
Heterogeneity: Tau2 =	0.43; Ch	$i^2 = 8.0$	0.003				
Test for overall effect	Z = 2.40	(P = 0.0)	0.002				

	HIFU Surgery		егу		Risk Ratio	Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Chen 2017	335	1353	719	1058	23.0%	0.36 [0.33, 0.40]	•
Liu 2017	2	99	8	67	8.6%	0.17 [0.04, 0.77]	
Liu 2020	60	101	67	87	22.5%	0.77 [0.63, 0.94]	-
Taran 2009	88	109	82	83	23.0%	0.82 [0.74, 0.90]	•
Wang 2013	49	60	56	60	22.9%	0.88 [0.76, 1.00]	•
Total (95% CI)		1722		1355	100.0%	0.59 [0.34, 1.04]	•
Total events	534		932				
Heterogeneity: Tau ² =	0.35; Ch	$i^2 = 274$	0.05 0.2 1 5 20				
Test for overall effect:	Z=1.82	(P = 0.0)	17)				Favours [FIHU] Favours [Surgery]

