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ZUIDEX™ FOR STRESS URINARY INCONTINENCE: IS THERE A CORRELATION BETWEEN IMPLANT VOLUME AND IMPROVEMENT IN INCONTINENCE?

Hypothesis / aims of study

The Zuidex™ system is a urethral injection therapy for stress urinary incontinence (SUI), in which an injection device – the Implacer™ – is used to reproducibly inject non-animal stabilised hyaluronic acid/dextranomer (NASHA/Dx) gel into the mid-urethra without the need for endoscopy. It has proven possible to visualise the NASHA/Dx gel deposits using magnetic resonance imaging (MRI), with the deposits observed in the desired location in the majority of cases (1). This study investigated whether a correlation exists between the total implant volume, as assessed by MRI, and improvements in incontinence.

Study design, materials and methods

Female patients aged at least 18 years (n=42) with SUI verified by demonstrable leakage on coughing or Valsalva manoeuvre were treated in a study to investigate Zuidex (Q-Med AB, Uppsala, Sweden) (2). The study was conducted in accordance with the Declaration of Helsinki and approved by relevant independent ethical committees. Patients received either 4 x 1.0 ml (Group A) or 4 x 0.7 ml (Group B) transurethral injections of NASHA/Dx gel administered using the Implacer. Patients not responding to the initial treatment were offered one further injection, 1–2 months after the first. An MRI study was performed as an addition to the main trial, and included patients consenting to the technique who were enrolled in the centre with relevant facilities (n=16; Table 1). The mean time to MRI examination was 35 days post-treatment (range, 1–92 days for Group A; 29–41 days for Group B), with MRI performed after the first treatment in all patients and again after re-treatment in 1 patient in Group A.

Table 1. Patient demographics.

	Group A (4 x 1.0 ml; n=8)	**Group B (4 x 0.7 ml; n=8)**
Mean age, years (range)	49.3 (35.2–67.6)	55.9 (42.6–77.9)
Mean body mass index, kg/m^2 (range)	24.5 (19.0–29.6)	23.9 (20.1–28.7)
Menopause, n (%)	3 (37.5%)	5 (62.5%)
1–2 deliveries, n (%)	8 (100.0%)	6 (75.0%)
3 deliveries, n (%)	0 (0.0%)	2 (25.0%)
Duration of symptoms >5 years, n (%)	7 (87.5%)	7 (87.5%)
Previous non-drug therapy for SUI, n (%)	8 (100.0%)	8 (100.0%)

MRI examinations were performed using a 1.5 T Magnetom Vision (Siemens AG, Germany) with a body coil and the patient in the supine position. To localise the deposits, a T2-weighted half-Fourier acquired single-shot turbo spin-echo sequence with 4 mm slices was used in the sagittal plane. A T1-weighted transversal spin-echo sequence was used for anatomical overview. For evaluation measurements of the injected deposits, a T2-weighted turbo-inversion-recovery sequence with 3 mm slice thickness was used in the transversal and coronal planes, and a T2-weighted 3-dimensional turbo spin-echo with 1 mm slice thickness in the sagittal plane. The largest diameter in three planes was measured for each deposit.Total implant volume was calculated using the formula for the volume of an ellipsoid: 4/3 π (length/2 x depth/2 x width/2) (3). The following were assessed at baseline, 3 and 12 months: urine leakage by provocation test, as measured by pad weight before and after 20 'jumping jacks' or 20 vigorous coughs (performed with 300 ml saline in the bladder); and number of incontinence episodes/24 hours, as assessed by a 1-week micturition chart. Correlations between the total implant volume and improvement from baseline to 3 and 12 months in provocation test urine leakage and number of incontinence episodes/24 hours were analysed using Spearman's correlation coefficient test (two-sided). Combined data (i.e. Groups A and B) were analysed.

Results

A total of 50 deposits were identified, with 39 clearly located within the urethral wall, as intended. Individual patient data are presented in Table 2. The total implant volume was 0.35–7.47 ml for Group A and 0.08–7.05 ml for Group B. Thirteen of 16 patients (81%) demonstrated an improvement *vs* baseline in provocation test urine leakage and the number of incontinence episodes/24 hours at both 3 and 12 months post-treatment.

Table 2. Individual patient deposit, implant volume and incontinence data after Zuidex treatment.

No. of deposits	Total implant volume (ml)	Change in provocation test urine leakage *vs* baseline (g)[a]		Change in no. incontinence episodes/24 hrs *vs* baseline[a]	
		3 months	12 months	3 months	12 months
4	7.47	-6	-6	-1.57	-1.57
0	–	-18	-18	-1.43	-1.43
3[b]	4.94	-60	-60	-1.00	-1.14
3	0.51	-67	-48	-3.71	-4.38
3	0.35	-50	-34	-.1.86	-1.71
3	3.49	-51	-51	-2.88	-2.88
0	–	-58	-53	-4.29	-4.29
4	4.20	-15	-15	-0.14	-0.14
3	1.14	+8	+20	+2.57	-0.29
2	0.08	-26	-26	-1.71	-1.00
5	1.63	-16	-16	-1.71	-1.57
4	6.36	+14	+5	+1.42	+1.86
2	1.32	-69	-70	-7.14	-7.14
1	0.99	-13	-16	-0.71	-0.43
6	7.05	-15	-43	-2.14	-2.86
4	4.97	-42	-50	-0.14	+0.17

[a]Last observation carried forward for missing values; [b]Patient received 1 re-treatment

No significant correlation between total implant volume and improvement in provocation test urine leakage was observed at 3 and 12 months (p=0.16 and p=0.54 respectively); similar results were noted for number of incontinence episodes/24 hours (p=0.23 and p=0.30, respectively).

Interpretation of results

Following treatment with Zuidex, improvements in incontinence occurred in the majority of patients, consistent with the results for the total study population in which significant reductions *vs* baseline were observed in provocation test urine leakage and the number of incontinence episodes/24 hours over 12 months ($p<0.0001$) (2). However, in the present study, no significant correlation was observed between total implant volume and improvement in incontinence. This concurs with the results of an earlier study in which the volume of intraurethral collagen was not found to be predictive of clinical outcome in women with SUI (3).

Concluding message

Injection therapy using Zuidex, in which the Implacer allows accurate placement of NASHA/Dx gel in the majority of cases, results in improvements in incontinence. However, these improvements do not significantly correlate with the total implant volume.

References

1. Magnetic resonance imaging to confirm the periurethral location of Zuidex™ deposits. 33rd Annual Meeting of the ICS, 5–9 October 2003, Florence, Italy.
2. Efficacy and safety of a novel system (NASHA/Dx copolymer via the Implacer device) for the treatment of SUI. Urology 2004; **64**: 276–281.
3. Magnetic resonance imaging after intraurethral collagen injected for stress urinary incontinence. J Urol 1996; **155**: 1253–1255.

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