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The use and success of cold coagulation for the treatment of high grade squamous cervical intra-epithelial neoplasia: a retrospective review

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ABSTRACT

Objective: Cold coagulation is recognised as a viable, cost-effective and successful treatment for cervical intraepithelial neoplasia (CIN), being used less frequently than excisional treatments for high grade lesions. We set out to demonstrate successful long term follow-up of patient with high grade CIN treated with cold coagulation.

Study design: We conducted a retrospective review over a one-year period of women with biopsy-proven CIN 2 and 3 who were treated with cold coagulation to the cervix, attending the colposcopy service of a large tertiary referral hospital. We examined follow-up cervical smear data for three years post treatment of low and high grade CIN, evaluated the success of treatment and re-treatment rates.

Results: 93 patients were included in our study, with 39 (41.9%) having CIN 1 and 54 (58.1%) diagnosed with CIN 2 or 3. Follow-up smears revealed low levels of recurrent high grade changes in both groups, with 31 (79.5%) of our CIN 1 group having a negative smear one year following treatment with cold coagulation, compared to 44 (81.1%) of patients with CIN 2 and 3. Successful primary treatment (i.e. no requirement for further treatment after 3 year follow-up) occurred in 33 (84.6%) of the CIN 1 group, and 42 (77.7%) of the CIN 2/3 group, demonstrating no statistical significance between re-treatment rates between both groups.

Conclusions: This study demonstrates the effectiveness of cold coagulation for the treatment of high grade cervical intraepithelial neoplasia. High success rates, and low re-treatment rates confirm that this is an acceptable primary treatment for CIN 2 and 3.

Introduction

In the last forty years, gynaecology has been revolutionised by the implementation of cervical screening programmes. Cervical Check, as part of the Irish National Cancer Screening Programme (NSCP), was introduced in September 2008 following success of a pilot scheme in the Mid-Western Region [1]. The implementation of national screening services in many countries over the past few decades has led to a significant decline in the morbidity and mortality associated with cervical carcinoma.

Through conventional Pap smears, and subsequently liquid based cytology, the implementation of a screening programme has allowed the diagnosis and treatment of cervical intra-epithelial neoplasia (CIN), thereby preventing progression of pre-invasive disease to invasive cervical carcinoma [2,3]. Colposcopy allows magnification, directed biopsies and treatment of such pre-cancerous lesions. Treatment can take the form of resection techniques (such as cone biopsy and Large Loop Excision of the Transformation Zone (LLETZ)), or ablative techniques (such as laser cryotherapy or cold coagulation). It has been demonstrated that excisional techniques, such as LLETZ, can increase obstetric risks, such as preterm labour and mid-trimester miscarriage [4,5], compared to minimal risk associated with cold coagulation.

The Semm cold coagulator utilises electrical energy to heat a thermosound probe, which causes ablation of cervical lesions [6]. Duncan demonstrated in 1991 that cold coagulation is an acceptable form of treatment for CIN 3 [7], which he continued to use in all grades of CIN over the coming years [8]. As well as having clinical advantages, it has been shown that patients also have a preference for cold coagulation, with decreased pain and speed of both treatment and recovery [9]. However, cold coagulation still has not been widely adopted by colposcopists, as the preference remains for excisional methods, mostly due to the advantage of histological examination of the transformation zone. In Ireland, the most recent report from the NSCP

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demonstrates that of those patients having treatment in colposcopy, 7236 (89.2%) had a LLETZ, with only 758 (9.3%) having cold coagulation out of 8109 over a one-year period [8]. Cold coagulation has continually been shown to have a comparable success rate to excisional treatment [10,11].

We aimed to demonstrate that our success rates were comparable to those in other centres, and further endorse cold coagulation as a feasible option to pursue for the treatment of high grade CIN, especially in young women.

Materials and methods

We conducted a retrospective study of all women referred to the Colposcopy Service of the University Maternity Hospital Limerick referred with high grade cervical smear abnormalities (e.g. high grade squamous intraepithelial lesion), who underwent a cold coagulation procedure for histologically confirmed CIN over a one-year period from January 2009 until January 2010. Patients were excluded if they had a previously treated cervical abnormality. All women were treated by application of the Semm coagulator probe (WISAP, Germany) to the cervix for thirty seconds to all areas of CIN.

Information such as patient demographics, smoking status, parity and initial smear findings were obtained from Compuscope, the national Colposcopy patient management and audit system, a database for assimilation and recording of data from colposcopic services. Details of histological diagnosis, follow-up cervical smears and additional treatments were also collected on an audit collection tool. Routine follow-up cytological and histological data was collected for a three year period (until April 2014) was collected. Intervals at follow-up in this observational study were routinely at six months, and yearly thereafter up to three years following treatment. As the study period was before the introduction of Test of Cure using Human Papilloma Virus testing, cure in this setting was defined as no requirement for re-treatment over the three year follow-up period. Data was entered into a secure database, and analysed using PASW Statistics.

Results

In total, 3850 patients attended our service during the study period. 651 patients underwent a treatment in 2009, with 321 (49.3%) having a LLETZ treatment and 309 (47.4%) having an ablative treatment. Of those treated with a CC, 93 patients had a high grade smear referral and were included in our study cohort. Of these 93 patients treated with CC, 41.9% ($n = 39$) women had biopsy proven CIN I, and 58.1% ($n = 54$) women had biopsy proven CIN 2/3. The average age was 29.2 years (SD = 5.5 years), with a mean parity of 0.7 (range 0–4, SD = 0.9). 45.2% of patients were nulliparous. 46.2% ($n = 43$) of patients were smokers.

The mean time between biopsy and treatment with cold coagulation was 4.4 months (SD = 3.6 months).

Table 1 demonstrates the follow-up smear results of those treated with cold coagulation for CIN 1 and CIN 2/3 at 6, 12, 24 and 36 months following treatment. In women treated with cold coagulation for CIN I, we demonstrate that one year following treatment 79.5% ($n = 31$) of women had a negative smear, with only one woman (2.6%) having a LSIL (low grade squamous intraepithelial lesion). Similarly, 76.9% ($n = 30$) had a negative smear three years following treatment. In our higher-risk cohort, 81.1% ($n = 44$) of women had a negative smear at one year following treatment, with only two women (3.8%) having a low grade changes. This is again mirrored in the three-year follow-up results with 38 (71.1%) of those who had cold coagulation for CIN 2/3 having a negative smear. Table 1 also demonstrates the rates for patients who did not attend follow-up at review intervals. 3 (3.1%)

Table 1
Follow up smear results after cold coagulation.

3 months follow up			6 months follow up			1 year follow up			2 year follow up			3 year follow up		
	CIN 1 % (*n*)	CIN 3/2 % (*n*)		CIN 1 % (*n*)	CIN 2/3 % (*n*)		CIN 1 % (*n*)	CIN 2/3 % (*n*)		CIN 1 % (*n*)	CIN 2/3 % (*n*)		CIN 1 % (*n*)	CIN 2/3 % (*n*)
Negative	5 (12.8)	13 (24.5)	Negative	19 (48.7)	18 (34.0)	Negative	31 (79.5)	43 (81.1)	Negative	13 (33.3)	13 (24.5)	Negative	30 (76.9)	38 (71.1)
ASCUS	7 (17.9)	8 (15.1)	ASCUS	6 (15.4)	6 (11.3)	ASCUS	6 (15.4)	6 (11.3)	ASCUS	1 (2.6)	3 (5.7)	ASCUS	0 (0)	1 (1.9)
LSIL	0 (0)	3 (5.7)	LSIL	2 (5.1)	1 (1.9)	LSIL	1 (2.6)	2 (3.8)	LSIL	1 (2.6)	0 (0)	LSIL	2 (5.1)	1 (1.9)
HSIL	2 (5.9)	6 (11.1)	HSIL	0 (0)	3 (5.7)	HSIL	0 (0)	0 (0)	HSIL	0 (0)	2 (3.8)	HSIL	0 (0)	2 (3.8)
DNA[a]	25 (64.1)	23 (43.4)	DNA[a]	12 (30.8)	25 (47.2)	DNA[a]	1 (2.6)	2 (3.8)	DNA[a]	24 (55.6)	35 (66.0)	DNA[a]	7 (17.9)	11 (20.8)

[a] DNA – did not attend.