

# THE ROLE OF ANTIOXIDANT SUPPLEMENTATION IN REDUCING THE ENDOMETRIOSIS RELATED CHRONIC PELVIC PAIN IN WOMEN

By

**Fathi Ibrahim Abd El-Fadil Sehsah, Ahmed Taha Abd El-Fattah and  
Ahmed Mohammed Saeed**

Obstetrics and Gynecology Department, Faculty of Medicine, Al-Azhar University, Egypt

**Corresponding author:** Fathi Ibrahim Abd El-Fadil Sehsah,

**Mobile:** 01009675740, **E-mail:** [dr\\_fathi\\_sehsah2012@yahoo.com](mailto:dr_fathi_sehsah2012@yahoo.com)

## ABSTRACT

**Background:** Endometriosis, an inflammatory ailment with concomitant pelvic pain and infertility, is related to inflammation and hormonal imbalances. The precise pathogenesis is not established, and its treatment residues as an argue. Oxidative stress (OS) is assumed to play a chief role in the etiology of Endometriosis. Antioxidant therapy for instance vitamin E and vitamin C may have activity in lessening or constraining inflammatory markers such as interleukins 1 and 6 and monocyte-chemotactic protein-1 that may account for the release of pain inducing molecules.

**Objective:** To evaluate the effect of antioxidant supplementation in the form of vitamins E and C in females experiencing chronic pelvic pain due to endometriosis.

**Subjects and methods:** This study was prospective randomized controlled work that enrolled 100 endometriosis cases who attended the department of obstetrics & gynecology and its out-patient clinic, El-Hussein University hospitals during the period of research from December 2018 to December 2019.

The patients were randomly distributed into 2 groups: 50 patients were given combination of vitamin E (1200mg/day) and vitamin C (1000mg/day) for 6-8 weeks and 50 patients were given placebo pills, daily for 6-8 weeks.

**Results:** After treatment trial, among the 50 patients on antioxidant supplementation, 20 patients (40 %) had reported reduction in menstrual cycle associated pelvic pain, “dysmenorrhea” compared to 9 out of 50 patients (18%) in the placebo group .As regard dyspareunia, results of the current work showed that after antioxidant treatment, pain with intercourse decreased in 16 women (32%) compared to four patients who only improved in the placebo group. According to dyschesia at both baseline and after therapy, result showed that after antioxidant treatment, the severity of dyschesia decreased in 16 women (32%). However in the placebo group, dyschesia improved only in two patients. As regard non-menstrual pelvic pain”, 21 patients (42%) had no change in “non-menstrual pelvic pain”, 24 patients showed decrease in non-menstrual pelvic pain and only 5 cases in placebo group showed improvement in the severity of non-menstrual pelvic pain.

**Conclusion:** This study advocates that natural antioxidants as vitamin E and C at low dosages are highly efficient substitute therapy to alleviate chronic pelvic pain in females with endometriosis.

**Keywords:** Endometriosis, Antioxidants, Vitamin E, Vitamin C.

## INTRODUCTION

The precise pathogenesis of endometriosis is not fully elucidated, but numerous risk factors may be implicated. There are diverse established therapeutic modalities with the foremost target is pain relief and averting future complications as infertility (*Balun et al., 2019*).

Chronic pelvic pain is outlined as cyclical or non-cyclical pain of 6 months duration as a minimum. Characteristics of pain may comprise dysmenorrhea, dyspareunia, dysuria and dyschezia. Dysmenorrhea individually does not establish chronic pelvic pain. Chronic pelvic pain accounts for around 20% of gynecological treatment center referrals and affects up to 24% of women globally with substantial influence on patients' quality of life (QOL) (*Ball and Khan, 2020*).

Oxidative stress is demarcated as an inequity between reactive oxygen species (ROS) and antioxidants, instigating an inflammatory response in the peritoneal cavity (*East-Powell and Reid, 2019*).

Accumulating data, points to that oxidative stress (OS), acts chiefly in the pathogenesis of Endometriosis. It is narrated to play an active part in the origination, maintenance, and progression of the disorder. The available medical treatment comprises non-steroidal anti-inflammatory drugs (NASIDs), combined oral contraceptives (COC), progestins, gonadotropin-releasing hormone agonists (GRHA), and danazol (*Dunselman et al., 2014* and *Baboo et al., 2019*).

Adverse effects are concomitant to the long-term usage of hormonal agents and upon termination of medication; relapse of

symptoms is not uncommon. Furthermore, existing therapeutic interventions remain suboptimal, making the women choose between the desires to conceive versus managing their pelvic pain (*Baboo et al., 2019*).

The utilization of clinical nutritional remedies such as vitamin E and vitamin C or what is called antioxidant treatment can display activity in downgrading or inhibiting inflammatory markers such as interleukins1 and 6 and monocyte-chemotactic protein-1 that may be accountable for pain inducing molecules release. Vitamin E also applies an anti-inflammatory influence via a decline in cyclooxygenase activity by inhibiting prostaglandin E2 production from arachidonic acid (*East-Powell and Reid, 2019*).

There is paucity in the literature on diet and the influence of the personal nutrients on endometriosis. Minor clinic- founded cross-sectional research has stated positive relations between vitamins C and E consumption and endometriosis (*Darling et al., 2013*).

**The aim of this study was to** evaluate the effect of antioxidant supplementation in the form of vitamins E and C in females experiencing chronic pelvic pain due to endometriosis.

## SUBJECTS AND METHODS

This was a prospective randomized controlled study that enrolled 100 endometriosis cases who attended at the Department of Obstetrics & Gynecology, and its out-patient clinic, Al- Hussein University Hospital during the period from December 2018 to December 2019. Women were complaining from pain

(dysmenorrhea, deep dyspareunia, dysuria, dyschazia, deep-chronic-pelvic pain), bleeding (menorrhagia, polymenorrhea), infertility, or acute abdominal pain. All patients have normal hepatic and renal functions. All patients have normal blood sugar (no Diabetes mellitus).

**Exclusion criteria:** Patients aged >41 years or <19 years or in the presence of any diagnosed endocrinopathy.

The elected patients were subjected to thorough history taking complete general and abdominal examination and laboratory investigations. The ultrasound equipment used was MINDRAY DC-N2, China, using a 3.5- 5-MHz trans-abdominal probe and 5-9 MHz trans-vaginal probe at the ultrasound unit of the Obstetrics and Gynecology Department (Al- Hussein University Hospital). The patients were randomly allocated into 2 equal groups: Group I: All patients were given vitamin E (1200IU); 3 Capsules of 400 mg each, Vitamin E; PHARCO company) and vitamin C (1000mg) 2 Capsules of 500 mg C-Retard each, Hikma company) combination for 6-8 weeks.. Group II: Patients were given placebo pills in the form of bran capsules, one capsule daily for 6-8 weeks.

At the baseline visit, after assessing eligibility and signing informed consent, the intensity was measured using a Visual

analogue score (VAS). All types of pelvic pain were categorized as mild when VAS was (4–5), moderate when VAS was (6–7), and severe when VAS was (8-10), and were registered as mild, moderate or severe (*Andres et al., 2014* and *Lete et al., 2018*).

Post-baseline pain was evaluated as during and afterwards treatment. At these visits, rescue analgesic medication and adversarial events were also recorded. General and Uterine side effects by regular ultrasound measurements of endometrial thickness and position of endometrial tissue out site the uterus side are noticed by history taking, general examination and investigation.

#### **Statistical analysis:**

Statistical analyses of data were carried out using SPSS version 23. Shapiro –Wilk test was used to test normal distribution of variables. Numerical data were expressed as mean  $\pm$  standard deviation. Categorical data were summarized as percentages. The significance for the difference between groups was determined by using two-tailed Student's t test or Mann-Whitney U Test which was used for comparison between two groups having quantitative variables without normal distribution (for non-parametric data). Also, qualitative variables were assessed by Chi-square  $\chi^2$  test. The probability (P) values of  $\leq 0.05$  were considered statistically significant.

## RESULTS

A total of 100 patients with EMs were conducted to assess whether antioxidant supplementation would ameliorate endometriosis-associated symptoms. There were no significant differences in demographic and clinical data including age, previous parity, body mass index, history of previous miscarriage, and bleeding characteristics among the both studied groups. The mean age at the time of presentation was  $25.36 \pm 3.75$  and  $26.18 \pm 4.24$  years in antioxidant-treated patients group and placebo group, respectively. Also, BMI was higher in antioxidant-treated patients ( $26.82 \text{ kg/m}^2$ )

compared to placebo cases ( $26.3 \text{ kg/m}^2$ ) but without significant different ( $P = 0.595$ ).

It has been found that 17 cases (34%) in antioxidant-treated group and 19 (38%) in placebo group have history of previous miscarriages, without significant different ( $P = 0.677$ ).

This study showed that there was no statistical significant difference in the mean previous parity in both studied groups ( $P = 0.368$ ). Also, there was no statistical significant difference bleeding characteristics in both studied groups ( $P = 1.000$ ) (Table 1).

**Table (1): Demographic and clinical data of patients**

Characteristics	Antioxidant-treated group (n = 50)	Placebo group (n = 50)	P
Age, years	$25.36 \pm 3.75$	$26.18 \pm 4.24$	0.188
Parity	$1.28 \pm 1.13$	$1.08 \pm 1.09$	0.368
BMI, $\text{kg/m}^2$	$26.82 \pm 5.06$	$26.3 \pm 4.56$	0.595
History of previous miscarriage n (%)			
No	33(66%)	31(62%)	0.677
Yes	17(34%)	19(38%)	
Bleeding characteristics, n (%)			
No	37(74%)	38(76%)	1.000
Menorrhagia	8(16%)	8(16%)	
Metorrhagia	3(6%)	2(4%)	
Menometorrhagia	2(4%)	2(4%)	

Data are presented as mean $\pm$ SD or n (%).

There was no significant difference between the percentage of cases with different levels of the severity of endometriosis associated pain including, dysmenorrhea, dyspareunia, and dyschesia in both studied groups and ( $P > 0.05$ ) except the non-menstrual pelvic pain as there were elevated numbers of women had non-menstrual pelvic pain in group that received antioxidant supplementations compared to those in

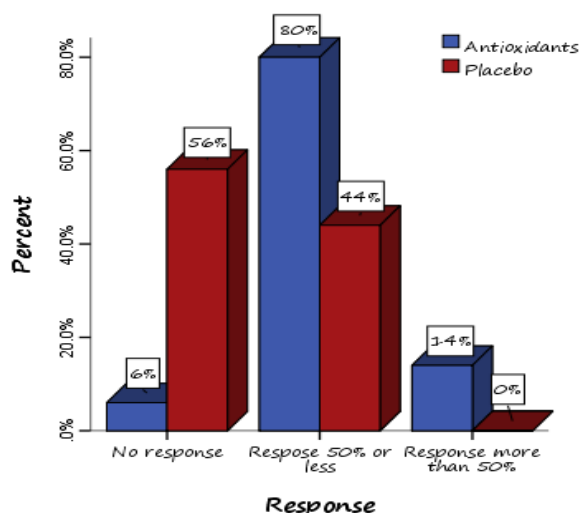
placebo group. Also, after treatment, the percentage of cases who had different levels of dyspareunia, dyschesia, and non-menstrual period pain were not statistically significant different between both studied group. However, cases who were treated with antioxidant showed statistically significant improvement in the severity of pain associated with menstrual cycle (dysmenorrhea) when compared to women who received placebo (Table 2).

**Table (2): Incidence of dysmenorrhea, dyspareunia, Dyschesia and non-menstrual pelvic pain before and after treatment in both groups**

Parameters \ Treatment		Before treatment		After treatment	
		Group (I) N=50	Group (II) N=50	Group (I)	Group (II)
Dysmenorrhea	No	7(14%)	0(0%)	8(16%)	0(0%)
	Mild	18(36%)	22(44%)	27(54%)	26(52%)
	Moderate	15(30%)	17(34%)	12(24%)	19(38%)
	Severe	10(20%)	11(22%)	3(6%)	5(10%)
	P-value	0.056		0.018*	
Dyspareunia	No	7(14%)	12(24%)	9(18%)	12(24%)
	Mild	19(38%)	14(28%)	27(54%)	15(30%)
	Moderate	20(40%)	14(28%)	12(24%)	16(32%)
	Severe	4(8%)	10(20%)	2(4%)	7(14%)
	P-value	0.127		0.07	
Dyschesia	No	11(22%)	9(18%)	15(30%)	9(18%)
	Mild	23(46%)	24(48%)	29(58%)	26(52%)
	Moderate	12(24%)	15(30%)	4(8%)	13(26%)
	Severe	4(8%)	2(4%)	2(4%)	2(4%)
	P-value	0.771		0.083	
Non-menstrual pelvic pain	No	4(8%)	12(24%)	13(26%)	12(24%)
	Mild (N=38)	23(46%)	15(30%)	20(40%)	17(34%)
	Moderate (N=32)	13(26%)	19(38%)	16(32%)	20(40%)
	Severe (N=15)	10(20%)	4(8%)	1(2%)	1(2%)
	P-value	0.025*		0.855	

Comparison between the two studied groups regarding response to medical treatment. There was statistical significant

difference between the two studied groups regarding response to medical treatment (P <0.001) (Figure 1).



**Figure (1): Comparison between the two studied groups regarding response to medical treatment**

Furthermore among the 50 patients on antioxidant supplementation, 20 patients (40 %) had reported reduction in dysmenorrhea. There was decrease in pain from severe to moderate in 7 (14%) patients, from moderate to mild in 12, and from mild to no pain in 1 patient. Twenty eight out of the 50 patients (56%) on antioxidant supplementation did not notice any change in pain associated with menstruation. Actually, 2 patients with mild menstrual pain got worse during the treatment. From Placebo group (group II), 9 out of 50 patients (18%) indicated decrease in dysmenorrhea, which on further analyses was a decrease in pain from severe to moderate in 5 patients, from severe to mild in 1 patient and from moderate to mild in 3 patients. The rest of the 41 patients did not report any changes in menstrual cycle associated pain. The results indicated that there was significant increase in number of cases who had an improvement in pain associated with menstrual cycle after antioxidant supplementation compared to that detected after administration of placebo (**Table 3**).

According to dyspareunia at both baseline and after therapy, result showed that after antioxidant treatment, pain with intercourse decreased in 16 women (32%) (3 cases from mild to no pain; 10 cases from moderate to mild, 1 case from severe to mild & 2 cases from severe to moderate) and no change was seen in 31 patients from them 6 had no dyspareunia

before therapy. In the same group, pain was reported to be increased in 3 patients; from those 1 did not have pain at baseline. However, four patients (8%) in the placebo group showed decrease in dyspareunia during the trial (1 case from moderate to mild & 3 cases from severe to moderate) (**Table 3**).

According to dyschesia at both baseline and after therapy, result showed that after antioxidant treatment, the severity of dyschesia decreased in 16 women (32%) (5 cases from mild to no pain, 9 cases from moderate to mild, 1 case from severe to mild & 1 case from severe to moderate) and no change in pain severity was seen in 23 patients. In the same group, pain increased in 1 case. In contrast, dyschesia improved only in two patients in the placebo group (2 cases from moderate to mild) (**Table 3**).

As regard non-menstrual pelvic pain", 21 patients (42%) had no change in "non-menstrual pelvic pain", 24 patients showed decrease in non-menstrual pelvic pain (7cases from mild to no pain; 2 cases from moderate to no pain; 6 cases from moderate to mild, 3 cases from severe to mild & 6 cases from severe to moderate) and 5 of the women (10%) had an increase in "non-menstrual pelvic pain" whereas only 5 cases in placebo group showed improvement in the severity of non-menstrual pelvic pain(2 cases from moderate to mild & 3 cases from severe to moderate) (**Table 3**).

**Table (3): Effect of antioxidant supplementation on “Dysmenorrhea, dyspareunia and non-menstrual pelvic pain” in both studied groups**

<b>Groups Parameters</b>	<b>Dysmenorrhea</b>	<b>Antioxidants group</b>	<b>Placebo group</b>
<b>Dysmenorrhea</b>	<b>Decreased pain</b>	20(40%)	9(18%)
	<b>No change</b>	21 (42%)	41 (82%)
	<b>Increased pain</b>	2(4%)	0(0%)
	<b>No pain at baseline</b>	7(14%)	0(0%)
<b>Dyspareunia</b>	<b>Decreased pain</b>	16(32%)	4(8%)
	<b>No change</b>	25 (50%)	34 (68%)
	<b>Increased pain</b>	3(6%)	0(0%)
	<b>No pain at baseline</b>	6(12%)	12(24%)
<b>Dyschesia</b>	<b>Decreased pain</b>	16(32%)	2(4%)
	<b>No change</b>	23 (46%)	39 (78%)
	<b>Increased pain</b>	1(2%)	0(0%)
	<b>No pain at baseline</b>	10(20%)	9(18%)
<b>Non-menstrual pelvic pain</b>	<b>Decreased pain</b>	24(48%)	5(10%)
	<b>No change</b>	17 (34%)	33 (66%)
	<b>Increased pain</b>	5(10%)	0(0%)
	<b>No pain at baseline</b>	4(8%)	12(24%)
<b>Total</b>		50 (100%)	50 (100%)

### DISCUSSION

The results of our study revealed that both studied groups were matched by age and BMI, and parity. In both groups most cases were nullipara: 30% of patients in the antioxidant and 38% were among the placebo group with no statistically significant differences between both groups regarding parity.

The relationship between endometriosis and infertility is thoroughly reinforced over the literature, but an explicit cause- outcome connection is still debatable. A considerably lower likelihood of pregnancy over 3 years is existing in women with minor endometriosis (36%) than women with unexplained infertility (55%) (Macer and Taylor, 2012). This may be enlightened by that women who suffer from more advanced endometriosis have poor ovarian reserve, oocyte and embryo quality, and also poor implantation (Park et al., 2019).

In the modern years, it has been retrieved that patients with endometriosis infertility rate can reach 35%-48%, while in the infertile cases, the incidence of endometriosis is approximately 30% to 45% (Mo and Zeng, 2020).

Concerning history of previous miscarriage, it has been found that 34% in group I and 38% in group II have history of previous miscarriages without significant difference between the two studied groups. Former research work were debated about the alliance between the miscarriage rates and endometriosis associated infertility (Yang et al., 2019). Santulli and his Co-workers (2012) reported that endometriosis women exhibited a significantly higher spontaneous miscarriages frequency than their endometriosis-free counterparts. Mo and Zeng (2020) mentioned that ovarian endometriosis adversely impacts the embryo quality via immune environment

and additional factors, piloting to unfortunate pregnancy outcomes and spontaneous abortion. However, *Leonardi et al. (2016)* noticed that the miscarriages number in women with and without endometriosis were comparable.

Regarding bleeding characteristics, most included cases had no abnormal uterine bleeding. The most common form of abnormal uterine bleeding recorded was menorrhagia followed by metrorrhagia then menometrorrhagia with no statistically significant difference between the two studied groups. Endometriosis may be asymptomatic but the most familiar clinical manifestations comprise cyclic menstrual pain, chronic pelvic pain, dyspareunia, menorrhagia, and dyschezia. Endometriosis can also has an impact on the menstrual cycles length together with bleeding time length. Meanwhile the endometriosis cases body has extra tissue to shed, thus, their periods may be elongated. Moreover, their cycles may become shorter than every 28 days. They may also suffer from bleeding and pain during ovulation (*Casper, 2017* and *Alimi et al., 2018*).

As regard different manifestation of pelvic pain before treatment, dysmenorrhea was present in 85% of cases with varying degree, dyspareunia was present in 84% of cases with varying degree, dyschezia was present in 75% of cases with varying degree, and non-menstrual pelvic pain was present in 83% of cases with varying degree. No significant difference between both studied groups as regard the percentage of cases who reported different levels of the severity of endometriosis associated dysmenorrhea.

After treatment trial, among the patients on antioxidant supplementation, 40 % had reported reduction in menstrual cycle associated pelvic pain, “dysmenorrhea”. Further analysis indicated decrease in pain from severe to moderate in 7 patients, from moderate to mild in 12, and from mild to no pain in 1 patient. 56% on antioxidant supplementation did not notice any change in pain associated with menstruation, i.e. dysmenorrhea. Actually, 2 patients with mild menstrual pain got worse during the treatment. In the placebo group, 18% indicated decrease in dysmenorrhea, with a decrease in pain from severe to moderate in 5 patients, from severe to mild in 1 patient and from moderate to mild in 3 patients. The rest of the 41 patients did not report any changes in menstrual cycle associated pain with significant increase in number of cases who had an improvement in dysmenorrhea after antioxidant supplementation. These results were in agreement in a previous work assessing the effect of vitamin E and C supplementation in comparison to placebo treatment and conducted by *Santanam et al. (2013)*. The similarity between results of the current work and was nearly the same age group between 19–41 years with endometriosis and history of different degrees of pelvic pain.

As regard dyspareunia, results of the current work showed that after antioxidant treatment, pain with intercourse decreased in 16 women (32%) and no change was seen in 31 patients. In the same group, pain increased in 3 patients; from those 1 did not have pain at baseline compared to four patients who only improved in the placebo group. These results were in line



with a prior study with analogous purpose conducted via *Santanam et al. (2013)* who reported that following antioxidant remedy, pain with intercourse decreased in eight women (24%) and no change was seen in 24 patients. In the same group, pain increased in 1 patient, 9 did not have pain at baseline without any case in the placebo group signposted either a decrease or increase in dyspareunia throughout their trial.

According to dyschesia at both baseline and after therapy, result showed that after antioxidant treatment, the intensity of dyschesia was diminished in 16 cases (32%) and no change was seen in 33 patients. In the same group, pain increased in 1 case. However in the placebo group, dyschesia improved only in two patients.

As regard non-menstrual pelvic pain”, 21 patients (42%) had no change in “non-menstrual pelvic pain”, 24 patients showed decrease in non-menstrual pelvic pain and 5 of the women (10%) had an increase in “non-menstrual pelvic pain” and only 5 cases in placebo group showed improvement in the severity of non-menstrual pelvic pain.

These results were in line with *Santanam et al. (2013)* who reported that eighteen of the forty -six patients in antioxidant group (43%) had an improvement in “everyday pain”, while 22 patients (52%) had no alteration in the everyday pain, four patients did not complain of everyday pain and two out of the whole women (5%) had reported an augmentation of the everyday pain. They also reported that placebo group did not show any alterations in everyday pain.

Moreover, another prior two studies that were organized in Mexico revealed an inverse correlation amid antioxidant in the form of vitamin E, vitamin C, zinc and selenium consumption and endometriosis pathology (*Guerrero et al., 2011*), and they declared that upon antioxidant rich nutrition supplementation, an improvement in antioxidant markers had occurred (*Mier-Cabrera et al., 2011*).

Oxidative stress has been postulated as a key player in the etio-pathogenesis of chronic pelvic pain (*Scutiero et al., 2017*). Oxidation products of polyunsaturated fatty acids (PUFA) for instance; 8-isoprostanes, hydroxyl eicosate-traenoic acid (HETE), and 13- or 9- hydroperoxy eicosatetraenoic acid (HPETE) are acknowledged to escalate nociception. Contrariwise, antioxidants independently or in combination with identified analgesics have been utilized to relieve pain in numerous circumstance and to decrease the free radical mediated nociception (*Wright, 2017*). Thus, alleviating pain allied to endometriosis is one of the main concerns in endometriosis research. Substitute strategies to mitigate endometriosis symptoms were endorsed by the International Consensus group (*Santanam et al., 2013*).

Vitamin E, a fat-soluble antioxidant, averts the setup of the vitamin E radicals, and vitamin C was complemented to this course of therapy since it functions in vitamin E radial recycling into vitamin E. Therefore, *Santanam et al. (2013)* attributed the effects of vitamin supplementation to its anti-oxidative and anti-inflammatory aspects, yet, there was no clear physiologic mechanism stated in their article. Moreover, Vitamin E role in

postponing chronic diseases, especially those assumed to have an OS component such as cardiovascular diseases (CVS), atherosclerosis, and cancer was also displayed in literature. Vitamin C, a water-soluble physiological antioxidant, plays a key role in the protection against diseases triggered by OS, averting lipid peroxidation, reducing antioxidative tocopherols (TOC) from TOC radical (*Baboo et al., 2019*). Furthermore, both Vitamins E and C may be entangled in clearing free radicals and ROS that have been incriminated in the endometrial cells growth and adhesion to peritoneal cavity (PC) in endometriosis women (*Jackson et al., 2010*).

Another report showed that besides the significant reduction in the endometriotic cysts volume and weight, the natural killer (NK) cell content diminished was also with vitamin C in a dose- reliant manner (*Erten et al., 2013*). Vitamins C and E special effects in endometriosis field have been also reviewed either isolated or together. In an experimental rat model, Vitamin C was discovered to successfully decrease the endometriotic implants volume. Nonetheless, the histopathological structure, did not display any significant modification in both the treatment groups, the authors owed these findings to the short duration (42 days) of treatment (*Erten et al., 2016*).

The work of *Durak et al. (2013)* in a rat model to decide if vitamin C supplementation would modify both volume weights of endometriotic lesions, they cured the experimentally provoked endometriotic cysts with varying vitamin C doses from 0.5mg to 1.25mg and and 2.5mg. The cysts treated with 2.5mg of

vitamin C were meaningfully shrunken in weight and volume proposing that antioxidants, for instance vitamin C, may lessen endometriosis symptoms by diminishing the lesion size.

In addition, a large prospective cohort research conducted via *Darling and his Co-workers (2013)* reported the inverse relationship between food ingestion of vitamins C and E and endometriosis, which could be attributable to the hypothetical mechanisms of micronutrients in hindering OS involved in the disorder. Furthermore, in a randomized double-blind study, thirty four women with endometriosis received a bar containing 343 mg 84 mg Vitamins C and E or a placebo treatment for 6 months duration, *Mier-Cabrera et al. (2010)* reported significantly declined malondialdehyde (MDA) and lipid hydroperoxides (LOOHs) quantities after four and six months Vitamin C and E treated patients contrasted to those who received a placebo. Nevertheless, pregnancy rate throughout or afterwards the intervention did not improved.

Likewise, in a novel randomized control trial, the effect of oral supplementation of 1,000 mg/day Vitamin C on the outcomes of in vitro fertilization-embryo transfer (IVF-ET) was examined in endometriosis patients, a total of 245 endometriosis cases and 132 patients free from endometriosis underwent successful IVF-ET and follow-up, and their both serum and follicular fluid (FF) antioxidant levels were paralleled both before and after therapy. Authors found significant increment in Vitamin C levels in serum and FF 2 months post-treatment, while OS markers were unaltered with Vitamin C in

endometriosis patients (*Lu et al., 2018*). Yet, there is paucity in the studies on the antioxidants influence in pain alleviating. No promising effect of fertility convalescence was reported. Few studies reported the low side effect profiles of these antioxidants but no side effects were reported in our study.

### CONCLUSION

This study advocates that natural antioxidants as vitamin E and C at low dosages are highly efficient substitute therapy to alleviate chronic pelvic pain in females with endometriosis. Further research work in this field is recommended.

**Ethical approval:** Approval of ethical committee was obtained from quality education assurance unit, Faculty of Medicine, Al-Azhar University Egypt.

**Conflict of interest:** The authors declare that they have no conflicts of interest.

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## دور استخدام مضادات الأكسدة في تقليل آلام الحوض المزمنة في السيدات اللاتي يعانين من بطانة الرحم المهاجرة

فتحي إبراهيم عبد الفضيل صحصاح, أحمد طه عبد الفتاح, أحمد محمد سعيد

قسم التوليد وأمراض النساء, كلية الطب, جامعة الأزهر

E-mail: [dr\\_fathi\\_sehsah2012@yahoo.com](mailto:dr_fathi_sehsah2012@yahoo.com)

**خلفية البحث:** تشكل بطانة الرحم المهاجرة التهاب في الحوض مصحوب بآلام في الحوض مصحوب في بعض الأحيان بعدم القدرة على الانجاب، ويرتبط هذا المرض بالالتهاب والاختلالات الهرمونية. ولم يتم إثبات المسبب الدقيق، و يفترض أن يلعب الإجهاد التأكسدي دوراً رئيسياً في مسببات بطانة الرحم. وقد يكون للعلاج بمضادات الأكسدة على سبيل المثال فيتامين هـ وفيتامين سي نشاطا في تقليل أو تقييد العلامات الالتهابية مثل الإنترلوكين ١ و ٦ والبروتين الكيميائي أحادي الخلية ١ الذي قد يفسر إطلاق الجزيئات المسببة للألم.

**الهدف من البحث:** تقييم تأثير مكملات مضادات الأكسدة على شكل فيتامينات هـ و سي في الإناث اللاتي يعانين من آلام الحوض المزمنة بسبب بطانة الرحم المهاجرة.

**المريضات وطرق البحث:** كانت هذه الدراسة عبارة عن دراسة جماعية استطلاعية شملت ١٠٠ حالة مصابات ببطانة الرحم المهاجرة واللاتي حضرن إلى قسم أمراض النساء والتوليد والعيادة الخارجية بمستشفيات الحسين الجامعي خلال فترة البحث من ديسمبر ٢٠١٨ إلى ديسمبر ٢٠١٩.

وتم توزيع المريضات بشكل عشوائي على مجموعتين متساويتين: مجموعة تناولت مزيجا من فيتامين هـ ١٢٠٠ وحدة (٣ كبسولات من ٤٠٠ مجم) وفيتامين سي (١٠٠٠ مجم) ٢ كبسولة من ٥٠٠ مجم لكل منها) لمدة ٦-٨ أسابيع، و مجموعة تم إعطائهن العلاج الوهمي يوميا لمدة ٦-٨ أسابيع.

**نتائج البحث:** بعد تجربة العلاج، من بين ٥٠ مريضة تناولن مكملات مضادات الأكسدة، أفادت ٢٠ مريضة (٤٠ %) بانخفاض في آلام الحوض المرتبطة بالدورة

الشهرية، "عسر الطمث" مقارنة بـ ٩ من أصل ٥٠ مريضة (١٨٪) في مجموعة الدواء الوهمي. وفيما يتعلق بعسر الجماع، أظهرت نتائج العمل الحالي أنه بعد العلاج بمضادات الأكسدة، انخفض الألم أثناء الجماع لدى ١٦ امرأة (٣٢٪) مقارنة بأربعة مرضى أبلغن عن تحسن فقط في مجموعة الدواء الوهمي. ووفقاً لالام التغوط قبل وبعد العلاج، أظهرت النتائج أنه بعد العلاج بمضادات الأكسدة، انخفضت شدة الألم لدى ١٦ امرأة (٣٢٪). ولكن في مجموعة الدواء الوهمي، تحسن الألم لدى مريضتين فقط. فيما يتعلق بالألم الحوض غير المرتبطة بالحوض، لم يطرأ أي تغيير على ٢١ مريضة (٤٢٪) وأظهرت ٢٤ مريضة انخفاضاً في آلام الحوض غير الحيضية، وأظهرت خمس حالات فقط في مجموعة العلاج الوهمي تحسناً في شدة آلام الحوض غير الحيضية.

**الإستنتاج:** مضادات الأكسدة الطبيعية مثل فيتامين هـ وفيتامين سي بجرعات منخفضة علاج بديل فعال للغاية لتخفيف آلام الحوض المزمنة لدى الإناث المصابات ببطانة الرحم المهاجرة.

**الكلمات الدالة:** بطانة الرحم، مضادات الأكسدة، فيتامين هـ، فيتامين ج.