SERUM METABOLITES ANTIOXIDANT STATUS AS IMMUNE ENHANCER IN EUTHYROID WOMEN WITH ANTI-THYROID AUTO ANTIBODIES (ATA)

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Abstract

OBJECTIVE: *This study was carried out to determine the serum metabolite antioxidants concentration(Vitamins C and E and other cofactors such as zinc and iron) serving as indicesand correlated with the anti-microsomal antibody level, which is one of the markers and causes of infertility in women..*

DESIGN: *A total of two hundred and four (204) Euthyroid women were selected from the volunteers that were recruited with informed consents, having satisfied the exclusion factors. Following the Ethics group's recommendations, blood samples were collected from each of the women in the test and control groups. The grouping was designed to contain thirty four (34) women each, whose blood samples were collected a week after their menses, except for pregnant women that were in their third trimester.*
Anti-thyroglobulin and anti-thyroid peroxidase (anti-TPO) was determined, using ELISA (enzyme linked immuno-sorbent assay). Antioxidants determination was carried out for vitamin C and E. Zinc and iron concentration was determined using the Atomic Absorption Spectrophotometer.

RESULT: *The study established the significant presence of anti-thyroglobulin and anti-thyroperoxidase as immune species markersof reproductive failure. The serum anti-thyroglobulin (Tg-Ab) level was significantly higher in the individuals in the secondary infertile (709.65± 3.20 U/ml) and primary infertile (509.59±3.70 U/ml) groups as well as the recurrent spontaneous aborter (400.00±3.20 U/ml) group, compared with the control women in the nulligravida (40.48±3.10U/ml), multiparous (30.02± 2.80U/ml) and the pregnant (30.90± 2.70U/ml) groups.*
The data analysis by Pearson (2 tailed) correlation showed that there was significant correlation at P< 0.05 between anti–TPO value and serum vitamin C concentration only. Whereas there was significance correlation at 0.01 level between anti- Tg value and serum vitamin C concentration.

Keywords: Anti-thyroglobulin (Tg-Ab), anti-thyroperoxidase (TPO-Ab), metabolic antioxidants,pregnancy, infertility and Recurrent Spontaneous Abortions

1.0 INTRODUCTION

1.1 The inability to get pregnantby women of childbearing age after about 12 months of regular unprotected sexual intercourse is called infertility in women. Primary infertility is the term used to describe women that has never been able to conceive after a minimum of 1 year of attempting to do so, (Anatoly, et al., 2010). It has been suggested that immunological factors may play an important role in reproductive process of fertilisation, implantation and placental development (Beer, et al., 1996). Women have a high degree of immunological responsiveness which is reflected by their increased susceptibility to non-organ specific autoimmune. Such increased susceptibility is supported by the fact that thyroid auto-antibodies have been associated with increased risk for pregnancy loss (Quintero, et al., 2012). Other studies have suggested an association between autoimmune factor and pregnancy wastage. It has been suggested that anti-thyroid auto-antibodies may serve as peripheral markers for abnormal T-cell function that may be responsible for pregnancy loss (Lee and Chang, 2012, Coulam, 1992). Furthermore, Pratt et al (1998) had demonstrated that detection of thyroid auto-antibodies before conception carried an increased risk of pregnancy loss.

1.2 The immune system is one of the most complex systems of the body and functions as the first line of defense against disease (Finch, 1994). It works by identifying proteins as normal or foreign, such that the immune response to a foreign body neutralize or destroy the antigen, this causes further production of antibodies made by white blood cells. Immune reactions are involved in several ways for normal pregnancy development. It is also through this reaction that the body can respond to invasion by foreign substances, (Fairweather, et al., 2012).

1.3.1 Vitamins as antioxidants are both top line factors in immune function and play supportive roles that enable the immune system to work at its peak. The vitamins share characteristics with other antioxidants such as, minerals and other phytochemicals whose activities serve to protect the cells against the damaging effects of highly reactive molecules known as free radicals (Balakrishan and Anuradha, 1998). Antioxidants are claimed to have the following: cellular protection, cancer prevention, promotes vision, heart disease prevention and enhanced immune function, (Nussinovitch and Shoenfeld, 2012). A few studies have clearly documented the beneficial efforts of dozens of antioxidant nutrients, (Bazzarreetal., 1992; Britesetal., 1999; Bruckner, 1997).

1.3.1.1 As water soluble vitamin, ascorbic acid performs its antioxidant functions within the aqueous compartments of the blood and inside cells and can help restore the antioxidant potential of vitamin E (Halliwell, 1999). Support of immune cell function, is a key role performed by vitamin C and an effect which may help fight infections in their early stages. It also involved in antibody production and helps in the function and activity of white blood cells. It further helps synthesize adrenal hormones, which help the body to deal directly with stress, mineral balances and inflammation. Research has shown that natural killer cell (NK cell) activity was enhanced as much as ten-fold in 78% of patients given buffered, vitamin C, while T- and B- cell counts were restored to normal levels, (Keen etal., 1994).

1.3.1.2 Vitamin E was discovered in the early 1930's when rats fed a diet free of vegetable oils (the primary dietary source of vitamin E), resulted in reproductive problems. Although vitamin E doesn't have exactly the same reproductive effects in humans, it is commonly thought of as a "virility" vitamin for men (Behl, 1999**).** For many years, vitamin E. was described as the "vitamin in search of a disease". While its deficiency diseases are still virtually unknown, its metabolic role in the body has become better understood in recent years, (Halliwell, 1999). Vitamin E is actually a family of related compounds known as tocopherols and tocotrienols. Although alpha-tocopherol is the most common form found in dietary supplements, vitamin E also exists with slightly different chemical structures as beta -, gamma – and delta –tocotrienols (Behl, 1999).

1.3.2 The trace element zinc is an essential micronutrient for the proper functioning of the immune system. Zinc deficiency leads to impaired function of the unspecific and specific immune response and consequently to an increased susceptibility to bacterial, viral and fungal infections. Immunological defects are not only seen in pronounced deficiency but even in marginal and moderate zinc deficiency. Lack of zinc is especially harmful for the development of the immune system, which stresses the importance of a balanced zinc level during pregnancy. However, gestational zinc deficiency due to an imbalance between intake and increased requirement is a common problem worldwide. Gestational zinc deficiency results in reduced thymus and spleen size and depressed active and passive immunity in the infants, depressed immunoglobulin levels, altered antibody repertoire, reduced proliferative response of lymphocytes and diminished neutrophil functions have been reported (Wellinghausen, 2001). Interestingly, immune defect caused by prenatal zinc deficiency, such as depressed antibody levels and lymphocyte proliferation may even persist in subsequent generations and are not reversible by postnatal zinc administration, (Wellinghausen, 2001)**.**

1.4 This study was carried out to determine the serum auto-antibody levels andto evaluate the metabolic antioxidants concentration in women experiencing,primary infertility that are positive to anti-thyroid auto-antibodies (anti-TPO) as primary markers compared with the antioxidants correlation in someEuthyroid Nigerian women.

2.0 MATERIALS AND METHODS

2.1 SUBJECTS RECRUITED:

Two hundred and four (204) women volunteers were recruited and took part in this study, of these;one hundred and two (102) patients were from the obstetrics and gynaecology unit of Ayinke house at the Lagos State University Teaching Hospital (LASUTH) grouped as the test subjects. Of these women, thirty four (34) eachwere grouped being diagnosed as experiencing Primary infertility, secondary and recurrent spontaneous abortion respectively. The one hundred and two (102) women were recruited in the control groups, made up ofthirty four (34)pregnant women volunteers (undergone antenatal care at the Ayinke House (LASUTH)) were recruited, while thirty four (34) each of Non-pregnant Nulligravida and multiparous women, from the family planning unit were recruited respectively. The exclusion factors include women that are hypertensive, experiencing thyroid diseases or on hormonal balancing drugs were ruled out. The study was conducted according to the ethical standard of the research and ethics committee of the Lagos State University Teaching Hospital.

2.2 BIOLOGICAL SAMPLES:

Venous blood sample was collected in triplicate into plain tubes of 10 ml each from the two hundred and four volunteers. The serums obtained after samples were allowed to stand for an hour and then centrifuged at 400 rpm for 10 minutes were stored at -4^0C until needed for analysis.

2.3 EXPERIMENTAL PROCEDURE:

The frozen serum samples were brought to room temperature and tested if positive to anti- thyroglobulin and anti-microsomal auto-antibodies (anti TPO) in both the test group and the control groups using a commercially available Enzyme linked immuno-absorbent assay (ELISA) kits. Positive results of anti-TPO antibody concentration are defined as titers greater than or equal to the benchmark of the normal level (of $\geq$ 40 U/ml). The bench marks for the determination of the anti-Tg level that was above normal level, of $\geq$ 200 Unit /ml, according to the manufacturer's instruction (Meridan Bioscience Europe).

Antioxidants determination was carried out for vitamin C and E by the methods of Behl, 1999. .Zinc and iron concentration was determined using the Atomic Absorption Spectra method byWellinghausen, 2001. The data computation and the correlation analysis was carried out using the analysis of variance (ANOVA) Package on the SPSS v.11 electronic statistical tools of windows www.spss.com.

3.0 RESULTS AND DISCUSSION:

3.1The serum anti-thyroglobulin (Tg-Ab) level result presented in Table 1 showed that, the concentration was significantly higher in the women in the secondary infertile (809.65± 3.23 U/ml) and primary infertile (539.59±3.79 U/ml) group as well as the recurrent spontaneous aborter (490.00±3.20 U/ml) group, compared with the concentration in the control group women,as follows; nulligravida (42.48±3.16 U/ml), multiparous (32.02± 2.82 U/ml) and the pregnant (31.90± 2.77 U/ml) .

3.2.1 The mean serum vitamin C concentration determined, was presented in Table 2. The mean serum vitamin C concentration in the nulligravida who were positive to anti-TPO with 2.39 ± 0.31 mg/dl and those negative to anti-TPO with 3.32± 0.29 mg/dl, and the positive value was significantly lower than the negative at P<0.05. In the multiparous women, the mean serum vitamin C concentration in the women who were positive to anti-TPO with 2.99 ± 0.22 mg/dl and negative anti-TPO of 1.67 ± 0.72 mg/dl, and the positive value was significantly higher than the negative at P<0.05. In the pregnant women the mean serum vitamin C concentration in the women who were positive to anti-TPO with 2.51 ± 0.23 mg/dl and negative anti-TPO with 1.98± 0.62 mg/dl, and the positive was significantly higher than the negative at P<0.05).

3.2.2 On the other hand, in the test group, the mean serum vitamin C concentration in the primary infertile women who were positive to anti-Tg with 1.95 ± 0.22 mg/dl and negative anti-Tg with 1.50 ± 0.88 mg/dl and the positive was significantly higher than the negative at P<0.05. The mean serum concentration of vitamin C for the secondary infertile women who were positive to anti-Tg with 1.91 ± 0.22 mg/dl and negative anti-Tg of 2.30 ± 1.25 mg/dl and the positive was significantly lower than the negative at P<0.05. The mean serum concentration of vitamin C for the RSA women was 0.75 ± 0.21 mg/dl this represent the marginal mean serum vitamin C concentration in the women with anti-TPO and anti-Tg that were both positive.At P < 0.05, the marginal mean serum concentration of the vitamin C in women in the control groups were significantly higher than the test groups. Also at P < 0.05, the negative anti – TPO of, the control group was significantly higher than in the test group.

3.3.1 The serum vitamin E antioxidant concentrations obtained were presented in Table 3, the mean serum vitamin E concentration in the nulligravida women who were positive to anti-TPO with 11.81 ± 0.73 µg/ml and those that were negative to anti-TPO with 12.94 ± 0.69 µg/ml, and those that were positive had value that was significantly lower than the negative at P<0.05). The mean serum concentration of vitamin E for the multiparous women for those positive to anti-TPO with 9.23 ± 0.54 µg/ml and those negative to anti-TPO with 8.67 ± 1.69 µg/ml and the value for those positive was significantly higher than for those that were negative at P<0.05. The mean serum concentration of vitamin E for the pregnant women was 7.05 ± 0.78 µg/ml, this value was the marginal mean for those who were positive to anti-TPO and those negative to anti-TPO was not significantly different. The marginal mean value for the nulligravida and multiparous women were significantly higher (P<0.05).

3.3.2 In the test groups, the mean serum concentration for vitamin E of the primary infertile women in those women positive to anti-Tg with 8.75 ± 0.52 µg/ml and those negative to anti-Tg with 6.00 ± 2.07 µg/ml, the positive was significantly higher than the negative at P<0.05. The mean serum concentration of vitamin E for secondary infertile women in those women positive to anti-Tg with 8.97 ± 0.51 µg/ml and those negative to anti-Tg of 12.00 ± 2.93 µg/ml where the positive was significantly lower than the

negative at P<0.05. The mean serum vitamin E concentration in the RSA women was 8.82 ± 0.50 µg/ml, this value was the marginal mean serum vitamin E concentration in those women having both anti-Tg and anti-TPO positive. Statistical analysis showed that values in the test group were significantly lower than in the non- pregnant control women, but higher than the pregnant women, at P< 0.05.

3.4.1 The table 4 depicts the mean serum concentration of zinc (Zn) in the women studied.The mean serum zinc (Zn) concentration in the nulligravida women was 0.61 ± 0.03 µg/dl, this represented the marginal mean and the positive anti-TPO was not significantly different from the negative at P<0.05. The mean serum zinc (Zn) concentration in the multiparous women positive anti-TPO of 0.39 ± 0.03 µg/dl and negative anti-TPO of 0.35 ± 0.08 µg/dl, and the positive was not significantly different from the negative at P<0.05. The mean serum zinc (Zn) concentration in the pregnant positive anti-TPO of 0.48 ± 0.03 µg/dl and negative anti-TPO of 0.46 ± 0.07 µg/dl, and the positive was not significantly different from the negative at P<0.05.

3.4.2 The mean serum zinc (Zn) concentration for the test group, in the primary infertile group was 0.55 ± 0.05 µg/dl, this represented the marginal mean and the positive anti-Tg was not significantly lower than the negative at P<0.05. The mean serum zinc (Zn) concentration in the secondary infertile women and the positive anti-Tg was not significantly higher than the negative at P<0.05. The mean serum zinc (Zn) concentration in the RSA women was 0.40 ± 0.02 µg/ml, this represented the marginal mean serum zinc (Zn) concentration in the women with anti-TPO and anti-Tg that were both positive. At P< 0.05, the marginal mean serum zinc concentration in the primary and the secondary infertile women were significantly higher than the value in the pregnant and the multiparous women of the control group but lower than the value in the nulligravida women.

3.5.1 The mean serum concentration of iron (Fe) obtained were presented in Table 5. In the control group, the mean serum iron (Fe) concentration in the nulligravida women was 0.86 ± 0.04 µg/dl, this represented the marginal mean serum iron (Fe) concentration and the positive anti-TPO was not significantly different from the negative at P<0.05. The mean serum iron (Fe) concentration in the multiparous women positive to anti-TPO was 0.63 ± 0.04 µg/dl and negative anti-TPO was 0.46 ± 0.12 µg/dl. The positive was significantly higher than the negative at P<0.05). The mean serum iron (Fe) concentration in the pregnant women positive to anti-TPO with 0.95 ± 0.04 µg/dl and negative anti-TPO of 1.03 ± 0.10 µg/dl, where the positive was significantly lower than the negative at P<0.05.

3.5.2 The obtained result within the test groups, of the mean serum iron (Fe) concentration in the primary infertile women was 0.92 ± 0.07 µg/ml, this represented the marginal mean serum iron (Fe) concentration in the women and the positive was not significant compared to the negative at P<0.05. The mean serum iron (Fe) concentration in the secondary infertile women positive to anti-Tg of 0.85 ± 0.04 µg/dl while the negative anti-Tgwas 0.49 ± 0.20 µg/dl and the positive was significantly higher than the negative at P<0.05. The mean serum iron (Fe) concentration in the RSA women was 0.92 ± 0.04 µg/dl, this represented the marginal mean serum iron (Fe) concentration in the women with anti-TPO and anti-Tg that are both positive. At P< 0.05, the women in the test groups were significantly higher than the non-pregnant multiparous women in the control group.

The Pearson (2 tailed) correlation showed that there was significant correlation at 0.05 between anti – TPO value and serum vitamin C concentration only. Whereas there was significance correlation at 0.01 level between anti- Tg value and serum vitamin C concentration.

TABLE 1 : COMPARATIVE ANALYSES OF SERUM THYROGLOBULIN AND THYROPEROXIDASE AUTO ANTIBODY ELISA VALUES OF THE WOMEN STUDIED.

Overall marginal mean /Number of Women with	**MeanTgAb (unit/ml)**	**MeanTpoAb(unit/ml)**	**Age range (years) /**

Parameters N=204	Anti-Tg	Anti-TPO	Anti-Tg(-)	Anti-Tg(+)	Anti-TPO(-)	Anti-TPO(+)	Age range	Duration
Control group Nulligravida Women n=34	40.48± 3.10	53.68 ± 1.00	40.48 ± 3.10	0	20.48 ± 1.40 n=15	80.88±1.30 n=19	20-50	-
Multiparous Women n=34	30.02± 2.80	50.81 ± 1.10	30.02 ± 2.80	0	30.60 ± 1.30 n=10	70.01 ± 0.90 n=24	20-28	-
Pregnant Women n=34	30.90± 2.70	40.00 ± 1.70	30.90 ± 2.70	0	30.50 ± 3.30 n=4	60.50 ± 0.90 n=30	20-46	-
Test group Primary Infertile Women n=34	301.80± 7.80	1203.50± 1.10	104.00±15.10 n=.2	509.59±3.70 n=32	0	1203.50±1.10	20-48	2-17
Secondary Infertile Women n=34	403.82± 7.70	600..39± 0.90	108.00±15.10 n=2	709.65±3.20 n=32	0	600.39± 0.90	21-48	0.5-10
Recurrent Spont. Aborter n=34	306.00± 10.80	707.41± 0.90	102.00±21.40 n=1	400.00±3.20 n=33	0	707.41± 0.90	20-39	1-8

Data are expressed as mean ±SEand analyzed by ANOVA (Two-way test)

P<0.05 – significant [a]P<0.05 comparing Anti-Tg/ Anti-TPO positive vs negative, [b]P<0.05 infertile women vscontrol group.

Table 2: COMPARATIVE ANALYSES OFANTI-OXIDANT (VITAMIN-C) CONCENTRATIONIN THE SERUM OF THE STUDIED EUTHYROID WOMEN WITH AND WITHOUT ANTI-MICROSOMAL AND ANTI-THYROGLOBULIN ANTIBODY.

PARAMETER	Vitamin C (mg/dl)	Vitamin C (mg/dl)		Vitamin C (mg/dl)	
SUBJECTS	Marginal mean value	Anti-TPO(-)	Anti-TPO(+)	Anti-Tg(-)	Anti-Tg(+)
Nulligravida Women n=34	2.83 ± 0.21 [c]	3.32 ± 0.29 n=18 [a]	2.39 ± 0.31 n=16 [a,b]	2.83 ± 0.21 [c] n=18 [b]	- n=16 [a,b]
Multiparous Women n=34	2.32 ± 0.38 [c]	1.67 ± 0.72 n=3 [a]	2.99 ± 0.22 n=31 [a,b]	2.32 ± 0.38 [c] n=3 [b]	- n=31 [a,b]
Pregnant Women n=34	2.24 ± 0.33 [c]	1.98 ± 0.62 n=4 [a]	2.51 ± 0.23 n=30 [a,b]	2.24 ± 0.33 [c] n=4 [b]	- n=30 [a,b]
Primary Infertile Women n = 34	1.72 ± 0.45 [c]	- n=2	1.72 ± 0.45 [c] n=32 [b]	1.50 ± 0.88 n=2 [a,b]	1.95 ± 0.22 n=32 [a]
Secondary Infertile Women n =34	2.11 ± 0.63 [c]	- n=1	2.11 ± 0.63 [c] n=33 [b]	2.30 ± 1.25 n=1 [a,b]	1.91 ± 0.22 n=33 [a]
Recurrent Spont. Aborter n=34	0.75 ± 0.21 [c]	-	0.75 ± 0.21 [c] n=34 [b]	- n=0	0.75 ± 0.21 n=34 [a]

Data are expressed as mean ± SE and analyzed by ANOVA (Two-way test), P<0.05 – significant

[a]P<0.05 comparing positive (+) and negative (-) Anti-TPO /Tg [b]P<0.05 test vs. control group. c=marginal mean value

Table 3: COMPARATIVE ANALYSES OF SOME ANTI-OXIDANT (VITAMIN -E) CONCENTRATIONIN THE SERUM OF THE STUDIED EUTHYROID WOMEN WITH AND WITHOUT ANTI-MICROSOMAL AND ANTI-THYROGLOBULIN ANTIBODY.

PARAMETER	Vitamin E (μ g/dl)	Vitamin E (μ g/dl)		Vitamin E (μ g/dl)	
SUBJECTS	Marginal mean value	Anti-TPO(-)	Anti-TPO(+)	Anti-Tg(-)	Anti-Tg(+)
Nulligravida Women n=34	12.38 ± 0.50 [c]	12.94 ± 0.69 n=18 [a]	11.81 ± 0.73 n=16 [a,b]	12.38 ± 0.50 [c] n=18 [b]	- n=16
Multiparous Women n=34	8.95 ± 0.89 [c]	8.67 ± 1.69 n=3 [a]	9.23 ± 0.54 n=31 [a,]	8.95 ± 0.89 [c] n=3 [b]	- n=31
Pregnant Women n=34	7.05 ± 0.78 [c]	7.00 ± 1.47 **n= 4** [a]	7.10 ± 0.54 n=30 [a,b]	7.05 ± 0.78 [c] n= 4 [b]	- n=30
Primary Infertile Women n = 34	7.38 ± 1.07 [c]	- n=2 [a,b]	7.38 ± 1.07 [c] n=32 [b]	6.00 ± 2.07 n=2 [a,b]	8.75 ± 0.52 n=32 [a]
Secondary Infertile Women n =34	10.49 ± 1.49 [c]	- n=1 [a,b]	10.49 ± 1.49 [c] n=33 [b]	12.00 ± 2.93 n=1 [a,b]	8.97 ± 0.51 n=33 [a]
Recurrent Spont. Aborter n=34	8.82 ± 0.50 [c]	-	8.82 ± 0.50 [c] n=34 [b]	- n=0	8.82 ± 0.50 n=34 [a]

Data are expressed as mean ± SE and analyzed by ANOVA (Two-way test), P<0.05 – significant

[a]P<0.05 comparing positive (+) and negative (-) Anti-TPO /Tg [b]P<0.05 test vs. control group. c=marginal mean value.

Table 4: COMPARATIVE ANALYSES OF ANTI-OXIDANTZINC (METAL) CONCENTRATIONIN THE SERUM OF THE STUDIED EUTHYROID WOMEN WITH AND WITHOUT ANTI-MICROSOMAL AND ANTI-THYROGLOBULIN ANTIBODY.

PARAMETER	**Zinc (zn) (μ g/dl)**	**Zinc (zn) (μ g/dl)**		**Zinc (zn) (μ g/dl)**	
SUBJECTS	Marginal mean value	Anti-TPO(-)	Anti-TPO(+)	Anti-Tg(-)	Anti-Tg(+)
Nulligravida Women n=34	0.61 ± 0.02 [c]	0.53 ± 0.03 n=18 [a]	0.69 ± 0.03 n=16 [a,b]	0.61 ± 0.02 [c] n=18 [b]	- n=16 [a,b]
Multiparous Women n=34	0.37 ± 0.04 [c]	0.35 ± 0.08 n=3 [a]	0.39 ± 0.03 n=31 [a,b]	0.37 ± 0.04 [c] n=3 [b]	- n=31 [a,b]
Pregnant Women n=34	0.47 ± 0.04 [c]	0.46 ± 0.07 n=4 [a]	0.48 ± 0.03 n=30 [a,b]	0.47 ± 0.04 [c] n=4 [b]	- n=30 [a,b]
Primary Infertile Women n = 34	0.55 ± 0.05 [c]	- n=2	0.55 ± 0.05 [c] n=32 [b]	0.56 ± 0.10 n=2 [a,b]	0.53 ± 0.02 n=32 [a]
Secondary Infertile Women n =34	0.50 ± 0.07 [c]	- n=1	0.50 ± 0.07 [c] n=31 [b]	0.49 ± 0.14 n=1 [a,b]	0.51 ± 0.02 n=31 [a]
Recurrent Spont. Aborter n=34	0.40 ± 0.02 [c]	-	0.40 ± 0.02 [c] n=34 [b]	-	0.40 ± 0.02 n=34 [a]

Data are expressed as mean ± SE and analyzed by ANOVA (Two-way test), P<0.05 – significant

[a]P<0.05 comparing positive (+) and negative (-) Anti-TPO /Tg [b]P<0.05 test vs. control group. c=marginal mean value

Table 5: COMPARATIVE ANALYSES OF ANTI-OXIDANTIRON (METAL) CONCENTRATIONIN THE SERUM OF THE STUDIED EUTHYROID WOMEN WITH AND WITHOUT ANTI-MICROSOMAL AND ANTI-THYROGLOBULIN ANTIBODY.

PARAMETER	**IRON(Fe) (μ g/dl)**	**IRON(Fe) (μ g/dl)**		**IRON(Fe) (μ g/dl)**	
SUBJECTS	Marginal mean value	Anti-TPO(-)	Anti-TPO(+)	Anti-Tg(-)	Anti-Tg(+)
Nulligravida Women n=34	0.86 ± 0.04	0.82 ± 0.05 n=18 [a]	0.89 ± 0.05 n=16 [a,b]	0.86 ± 0.04 n=18 [b]	- n=16
Multiparous Women n=34	0.54 ± 0.06	0.46 ± 0.12 n=3 [a]	0.63 ± 0.04 n=31 [a,b]	0.54 ± 0.06 n=3 [b]	- n=31
Pregnant Women n=34	0.99 ± 0.05	1.03 ± 0.10 n=4 [a]	0.95 ± 0.04 n=30 [a,b]	0.99 ± 0.05 n=4 [b]	- n=30
Primary Infertile Women n = 34	0.92 ± 0.07	- n=2 [a,b]	0.92 ± 0.07 n=32 [b]	0.93 ± 0.14 n=2 [a,b]	0.90 ± 0.04 n=32 [a]
Secondary Infertile Women n =34	0.67 ± 0.10	- n=1 [a,b]	0.67 ± 0.10 n=31 [b]	0.49 ± 0.20 n=1 [a,b]	0.85 ± 0.04 n=33 [a]
Recurrent Spont. Aborter n=34	0.92 ± 0.04	-	0.92 ± 0.04 n=34 [b]	-	0.92 ± 0.04 n=34 [a]

Data are expressed as mean ± SE and analyzed by ANOVA (Two-way test), P<0.05 – significant

[a]P<0.05 comparing positive (+) and negative (-) Anti-TPO /Tg [b]P<0.05 test vs. control group. c=marginal mean value

4.0 CONCLUSION:

This study was designed, executed and thus provided the local views on the African women immune reproductive assessment from the point of view of the results obtained from some volunteer Nigerian women residing in Lagos with recurrent spontaneous abortions (RSA) and infertility of immune etiology. The volunteer women in this study were grouped into the age brackets classified into early and late marriages, as recruited from among the women attending the various clinics visited, that were within the reproductive age brackets,

The biochemical indices determined in the women studied included the Metabolites influences in reproduction usually are pronounced at the level of coenzymes or a metal co-factor that also may serve as immune enhancer because of their antioxidant properties. In this study vitamin E and zinc levels in the test and control groups showed some association. The antioxidant levels showed that zinc may be more important than iron, while vitamin E responded more than vitamin C.

Thyroid auto-antibodies have been predicted to be independent markers for pregnancies at risk for loss,(Ntrivalas, etal., 2005). The women who have significant anti-thyroid antibodies levels miscarry at approximately twice the rate of women who have no anti-thyroid antibodies, therefore history of two or more pregnancy losses or unexplained infertility should be investigated for the presence of anti-thyroid antibodies (*Hill and Chol,2000*).

This study agrees with previous reports (Coulam, etal., 2006, Coulam 1992), which has shown that, high titers of this auto-thyroperoxidase in euthyroid patients (i.e. without clinical evidence of thyroid dysfunction), is a positive phenomenon, in association with recurrent pregnancy loss. In this study the anti-Thyroglobulin (anti-TgAb) and anti-Thyroperoxidase (anti-TPOAb) auto antibodies mean titer levels showed that the anti-TgAb and anti-TPOAb were higher in test groups compared to the control groups, (GleicherandBarad 2007). The anti-TgAb levels of the three tests group were significantly higher than the control groups. Whereas it was in only the secondary infertile women group was the anti-TgAb titer levels, significantly higher within the test group. The anti-TPOAb mean titer levels in secondary infertile, the spontaneous aborter and primary infertile women in this study were significantly higher compared with the control groups thus providing the primary marker for the reproductive failure, (Kessler atal., 2008)..

The positive anti-TPO-Ab titer mean levels in pregnant group, multiparous group and nulligravida group were significantly high within the control groups, this suggest that low levels of antiTg-Ab may not hinder reproductivity.

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