

Awareness of antimullerian hormone assay and its relevance in in-vitro fertilization among laboratory scientists

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Abstract

Background: infertility is a challenging medical disorder affecting 1 in every 6 couples. In-Vitro fertilization(IVF) offers hope for couples to actualize their dreams of procreation. Success with IVF is determined by several factors including ovarian reserve which can be determined by measuring serum levels of Antimullerian hormone (AMH). We evaluated the level of awareness of laboratory personnel on AMH and IVF in our environment.

Methods: A self-administered questionnaire was administered to laboratory scientists at an annual conference of laboratory scientists.

Result: A total of 174 questionnaires to 87 males and 87 females. Most of the participants were classified as senior staff (44.8%) while 8.6% were administrators/ directors. Our study revealed that 80.5% of the respondents had never heard of AMH although 70.1% had knowledge of IVF. The least

commonly requested laboratory test for infertility evaluation was AMH (9.1%) while semen analysis was the commonest test (28.7%). Most respondents were of the opinion (98%) that both male and females should be evaluated when managing infertile couples.

Conclusion: The awareness of AMH and its use in evaluating infertile patients is low among scientists in our environment. The educational system should be involved in revising curriculums especially in areas of current methods for successful IVF treatment.

Key words: Antimullerian hormone, In Vitro Fertilization, Infertility, Laboratory scientist

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Introduction

Infertility, the inability to conceive despite regular unprotected intercourse for a period of one year is a source of much distress among couples. Worldwide, about 580million people are estimated to experience infertility with Africa bearing the largest burden of approximately about 10-32% couples suffering this scourge¹⁻³. Studies done in the South Western part of Nigeria reported a prevalence rate of 22.7%⁴. Multiple factors are responsible for infertility with various researchers showing equal responsibility attributable to male and female factors^{1,4,5}. Hormonal treatment, counseling and corrective surgeries serve as infertility therapy which may lead to conception in some infertile couples. Currently, patients who do not respond to the conventional therapy take advantage of the assisted reproductive technology which offers hope for them to achieve their dream of conceiving.^{6,7}

There is a growing awareness of IVF as one of the

procedures for infertility treatment and it is being taken advantage of in Nigeria.⁸ It is a method which entails giving the infertile woman medications to stimulate multiple egg/ova development which are then retrieved surgically and fertilized in the laboratory using the partner's sperm. IVF is highly technical and expensive and would appear to be mostly available to the affluent.⁸ Various researchers have shown that serum Antimullerian hormone(AMH) level is used as a factor for determination of IVF success⁹⁻¹¹. This hormone is produced by the antral follicles in the ovaries hence it is a measure of ovarian reserve. Its estimation in the laboratory requires highly skilled personnel and precise equipment. Currently in Nigeria, there are few Medical Laboratories where AMH is measured probably due to the expensive machines and reagents required for its estimation. Our work was aimed at assessing the level of awareness of Medical Laboratory staff in regards to IVF and AMH relevance in our environment.

Materials and Methods

This was a questionnaire based study with study population consisting of Medical Laboratory Workers who worked in various laboratories in Jos, Plateau state, Nigeria. Structured, self-administered questionnaires were distributed to 200 conference participants at the 2014 Annual Scientific Conference of Medical Laboratory Scientists held Hill station Hotel in Plateau State, Nigeria. Only 174 questionnaires were properly

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filled and therefore analysed. The questionnaire consisted of questions with closed ended responses. Information regarding socio-demographic data, knowledge and awareness of AMH and IVF technique and availability of equipment for this assay was obtained. Informed consent was obtained from all respondents.

For analysis of awareness questions, respondents who were aware of AMH and IVF ticked "Yes" while those who were not ticked "No". Respondents were grouped based on their rank, years of practice, place of practice and awareness tested based on these differences. Data entry and analysis was done using excel and SPSS. Variables were presented as frequency tables and percentages. Chi squared test was used to test for association between categorical variables. P value <0.05 was considered significant.

Results

A total 200 questionnaires were administered of which 174 were completely filled giving a response rate of 87%. This consisted of 87 males and females each. The age group 26-35 years had the greatest number of participants (42.5%) while age group >45 years had the least participants (11.5%). Based on area of specialty; Microbiology had 60 (34.5%) participants (Table 1). Most of the Participants were senior staff (44.8%). Majority of our participants (52.3%) had less than five years working experience.

Table 1: Demographic variables of sampled respondents

| Variables | Frequency (n=174) | Percentage (%) |
|---------------------|-------------------|----------------|
| Gender | | |
| Male | 87 | 50.0 |
| Female | 87 | 50.0 |
| Age group | | |
| 18-25 | 32 | 18.4 |
| 26-35 | 74 | 42.5 |
| 36-45 | 48 | 27.6 |
| >45 | 20 | 11.5 |
| Speciality | | |
| Microbiology | 60 | 34.5 |
| Chem. Path. | 33 | 19.0 |
| Haematology | 39 | 22.4 |
| Histopathology | 19 | 10.9 |
| Virology | 10 | 5.7 |
| Parasitology | 13 | 7.5 |
| Rank | | |
| Student | 57 | 32.8 |
| Senior staff | 78 | 44.8 |
| Principal | 24 | 13.8 |
| Above principal | 15 | 8.6 |
| Years of experience | | |
| < 5 | 91 | 52.3 |
| 5-10 | 45 | 26.5 |
| >10 | 38 | 21.3 |

The Majority of the respondents; 140 (80.5%) had never heard of AMH although 70.1% were aware of IVF. The Majority (78.7%) indicated they would be willing to

recommend IVF for infertile couples. Twenty males (23%) and 14 (16.1%) females respectively were aware of AMH (p=0.251). On the awareness of IVF, fewer males 57 (65.5%) than females 65 (74.7%) were aware of IVF technique (p=0.185). Fewer students were less aware of AMH and IVF compared to the other respondents (Table 2).

Table 2: Awareness of Antimullerian hormone and IVF in relation to demographic variables

| Variables | Antimullerian hormone | | P | IVF | | P |
|---------------------|-----------------------|-----------|-------|------------|-----------|-------|
| | Yes, n (%) | No, n (%) | | Yes, n (%) | No, n (%) | |
| Gender | | | | | | |
| Male | 20(23.0) | 67(77.0) | 0.251 | 57(65.5) | 30(34.5) | 0.185 |
| Female | 14(16.1) | 73(83.9) | | 65(74.7) | 22(25.3) | |
| Age group | | | | | | |
| 18-25 | 1(3.1) | 31(96.9) | 0.049 | 19(59.4) | 13(40.6) | 0.106 |
| 26-35 | 19(25.7) | 55(74.3) | | 54(73.0) | 20(27.0) | |
| 36-45 | 11(22.9) | 37(77.1) | | 38(79.2) | 10(20.8) | |
| >45 | 3(15.0) | 17(85.0) | | 11(55.0) | 9(45.0) | |
| Specialty | | | | | | |
| Microbiology | 12(20.0) | 48(80.0) | 0.926 | 35(58.3) | 25(41.7) | 0.098 |
| Chem. Path. | 8(24.2) | 25(75.8) | | 27(81.8) | 6(18.2) | |
| Haematology | 8(20.5) | 31(79.5) | | 32(82.1) | 7(17.9) | |
| Histopathology | 3(15.8) | 16(84.2) | | 13(68.4) | 6(31.6) | |
| Virology | 1(10.0) | 9(90.0) | | 6(60.0) | 4(40.0) | |
| Parasitology | 2(15.4) | 11(84.6) | | 9(69.2) | 4(30.8) | |
| Rank | | | | | | |
| Student | 2(3.5) | 55(96.5) | 0.001 | 33(57.9) | 24(42.1) | 0.018 |
| Senior staff | 24(30.8) | 54(69.2) | | 64(82.1) | 14(17.9) | |
| Principal | 4(16.7) | 20(83.3) | | 15(62.5) | 9(37.5) | |
| Above principal | 4(26.7) | 11(73.3) | | 10(66.7) | 5(33.3) | |
| Years of experience | | | | | | |
| <5 | 10(11.0) | 81(89.0) | 0.004 | 61(67.0) | 30(33.0) | 0.371 |
| 5-10 | 16(34.8) | 30(65.2) | | 36(78.3) | 10(21.7) | |
| >10 | 8(21.6) | 29(78.4) | | 25(67.6) | 12(32.4) | |

The least commonly requested laboratory test for infertility evaluation was AMH (9.1%) while semen analysis was the commonest test (28.7%). Other tests reportedly done included serum measurement of follicle stimulating hormone (FSH) by 16.2%; luteinizing hormone (LH) 15%, testosterone (16%) and Prolactin (11.6%). On the availability of equipment for infertility management, respondents were of the opinion that the federal government owned institutions had the most equipment (79.8%) followed by private organizations (11%). Most respondents (98%) indicated that both males and females be evaluated when managing infertile couples.

Discussion

The main finding in this study was that 70.1% of the respondents were aware of IVF procedures but only 19.5% were aware of AMH. In Vitro fertilization as a treatment modality for infertility has been popular since the first baby was born over 36 years ago with varying degrees of success recorded around the world.¹³ In addition to other factors, the quality and quantity of ova available for fertilization is a major determinant of the

success or otherwise of IVF.¹⁰⁻¹⁴ Several tests and assays have been employed to determine ovarian reserve and thereby serving as predictors of IVF success. Such tests as antral follicular count (AFC) and Follicle Stimulating Hormone assay have been used with varying degrees of success.¹⁰ More recently Antimullerian hormone assay has proven to be a more consistent predictor of ovarian reserve.¹⁴

Majority of the scientists (78.7%) were willing to recommend IVF to infertile couples. Misconceptions have long trailed IVF with many a scientist being of the opinion that babies resulting from this form of therapy are artificial or defective in one way or the other resulting in reluctance to on their part to recommend it.¹⁰ Some studies have cited religious and cultural objections as reasons why some would not recommend this form of treatment for infertility.⁵ The willingness therefore to recommend this form of management may occasionally be lacking. Other studies on the other hand have shown a willingness on the part of Gynaecologists and infertile women to recommend IVF to infertile couples.⁸ Ajayi et al⁸ noted that in southern Nigeria that 99% of Gynaecologists would recommend IVF for infertile couples despite the high cost.

The Lack of awareness of AMH may be due to the fact that it is a relatively new assay for IVF procedures.^{10,11} It is currently viewed as superior to the pre-existing measurements of ovarian reserve and considered as the cornerstone for infertility investigation and treatment.¹⁴⁻¹⁷ Majority of the respondents indicated that Semen analysis was the test most commonly requested while AMH was the least requested laboratory test for investigation and management of infertility. This finding supports the work of Owolabiet al³ who suggested that semen analysis was most frequently ordered for the laboratory evaluation of male infertility. The lack of awareness of AMH seen among the students who participated in this study may confirm that this assay is a new method and may not have been included in their course work and hence a low level of awareness.

Our findings cannot be generalized to all medical laboratory workers as the study is limited by the small sample size. Additionally, we cannot disregard the impact of recall bias on our findings as this was a questionnaire based study. However, our study does bring to fore the awareness of AMH among these workers.

This work has shown that the awareness of AMH relevance and measurement by Medical Laboratory workers is low in our environment. Students are not aware of this current technique for infertility management. Medical Laboratory scientists and teachers of medical laboratory students should make every effort to keep updated with the ever changing knowledge and practice in the field of infertility.

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