Importance of Ovarian Volume in Determining the Ovarian Reserve as Well as Hormonal Function Besides Determining the Polycystic Ovary Morphology (PCOM) and Classification of Polycystic Ovary Syndrome (PCOS). A Short Communication

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Ovarian volume has been utilized as an ovarian reserve marker, a diagnostic method for poly cystic ovary syndrome (PCOS), as well as risk of ovarian tumors as well as a part of examining normal as well as abnormal pelvis. Earlier the author had discussed the role of ovarian volume in case of PCOS with regard to Polycystic Ovary Morphology (PCOM) and classification of PCOS and how it reduces with age [1]. Villa., *et al*. showed that mean Ovarian volume (MOV) > 5.6 in adolescent girls enhanced the chances of developing PCOS by 15 times [2]. Examination of the ovarian reserve and evaluating the response to exogenous hormones related to ovarian hyperstimulation as well as assisted reproductive technology (ART) constitute essential components for obtaining success following fertility therapy [3]. Measuring anti-mullerian hormone (AMH) has aided in giving innovative knowledge on these topics in current years, but AMH itself possesses limitations in view of marked variation during the menstrual cycle, various assays do not measure the similar AMH levels and particular samples might behave separately based on the assay [4,5]. Alternative ones like follicle stimulating hormone (FSH) as well as inhibin-B might add to the details but usually have not much value in view of marked variation in a cycle. Ovarian volume on the basis of ultrasonography (USG) measures has been utilized as an extra marker, but volume measured by transvaginal sonography (TVS), presuming a prolate ellipsoid subject shape can markedly vary as per the interobserver changes [6]. Moreover, it has been documented that the volume determined by USG was decreased minimum by weight, knowing that 1g tissue is equivalent to a volume of 1 ml [7]. These limitation have reduced the utilization of USG measured Ovarian volume. Yet Ovarian volume has been accepted as the parameter in the diagnosis of poly cystic ovary syndrome (PCOS), in which case a cut off volume of 10 mL is 1 of the factors utilized in differentiating women having PCOS from women with normal ovaries as per the Rotterdam criteria [8]. One study observed that the Luteinizing hormone (LH) amounts as well as LH/FSH ratio, but not AMH levels, were associated with USG-based Ovarian volume in women with PCOS. Furthermore, it has been illustrated that USG-based Ovarian volume is significantly positively correlated with T amounts in women with PCOS [9,10].

Wakimoto., *et al*. [11], from Demmark studied ovaries from 765 patients where a normal looking ovary was surgically taken out with the aim of fertility preservation and precise weight of the ovary was checked. These ovaries had been removed prophylactically for a cohort of women having a diagnosis where treatment done medically would enhance the chances of premature ovarian failure (POF), like mostly a cancer diagnosis, or an autoimmune or genetic disease. These women were adult/adolescents (> 15yrs) who had not got any cancer treatment and in which ovarian weight was measured with the use of a precision balance, that were free of any adherent tissue. Earlier the same authors had found a correlation among ovarian weight as well as Ovarian volume in 11 women where a volume of 1 ml related to 1g of tissue [6]. In 386 of these patients one or serum hormone levels of AMH, LH, FSH as well as testosterone (T) were measured

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before the ovary was collected. A good association was shown among the AMH in peripheral blood and the Ovarian volume. This does not come as a surprise, knowing that larger ovaries have a tendency of having antral follicle count that we know correlate with the amount of circulating AMH. This correlation has been shown earlier in studies that have been smaller and is of importance in assuring us that AMH levels correlate with the Ovarian volume if imaging is not feasible. The LH/FSH ratio, was markedly associated with the Ovarian volume mainly in view of the LH amount being significantly with escalating volume. T was also elevated, that is also not astonishing, knowing the number of antral follicles as well as theca cell mass in larger ovaries. While a significant correlation among body mass index (BMI) as well as Ovarian volume as well as T these were only of borderline significance.

This special set of samples obtained via gynaecologically healthy young women as well as adults gives us much superior profile of the Ovarian volume as correlated with hormone amounts than what had been documented earlier. What is of interest is that the range of AMH as well as Ovarian volume displayed a continuous increase with no dramatic changes at any cut off point. This emphasizes the problem in the utilization of an ovarian volume > 10 mL or an earlier determined AMH in making out the poly cystic ovary morphology [12]. The values utilized in early publications for separating poly cystic ovary morphology from normal are based on positive as well as negative predictive values instead of any true biological cutoffs [13]. An escalation in BMI influences only marginally the ovarian volume, AMH or LH amounts as well as total T, pointing that BMI amounts don't need to be taken up for calculating regarding normal values. AMH gets synthesized only in ovaries, LH via pituitary gland and total T by ovaries as well as peripheral tissues. Thus, it is not astonishing that AMH correlated well with ovarian volume, whereas LH/FSH ratio possibly points to feedback from the ovarian tissue through hormones like inhibin/sex steroids. The total T positively correlated with ovarian volume possibly depicting the amount of theca tissue that is in the ovary as well as increased the enhanced amount of circulating LH with a number of LH receptors overall.

This illustration that ovarian volume correlated quiet well with certain crucial hormones emphasizes the importance of trying to get a more quantitative value of ovarian volume that is dependable in normal women getting evaluation for number of problems [14]. It is possible that these formulae for volumes do not work well. We require sophisticated methods, that might be improved mathematical formulae, definition USG imaging techniques, improvement in computer dependent technologies for measuring these whole volumes or more practical magnetic resonance imaging (MRI) methods. Although the Danish study has some limitations, that are missing data, a retrospective data set, absence of preoperative USG data, the usage of just one ovary as compared to both with the probability of the endocrine milieu of the gynaecological condition causing surgery to be changed, these data will increase our wanting to get a more dependable evaluation of ovarian volume.

Pelvic USG is usually done poorly and associated with poor reporting. Thus, this study teaches us that examination of ovarian volume tells us information regarding ovaries and this is an indirect estimate of certain critical hormonal data and thus clinical condition. Greater attention is required to be given for precise measurement, calculation as well as reporting of ovarian volume in gynaecology [14].

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