Can Varicocelectomy Improve the Seminal Fluid Parameter Abnormalities?

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INTRODUCTION

Sub-fertility is one of the main health problems, and it affects approximately 15% of the married couples in reproductive age (1). About 50% of sub-fertility is due to male factors (2). Idiopathic infertility is the most common type of male infertility (3). Varicocele is another common cause of male sub-fertility and it is considered as one of the common surgically correctable causes of male sub-fertility. Prevalence of varicocele among general population is about 15%. forty percent (40%) of male with primary sub-fertility and approximately 80% of males with secondary sub-fertility are found to have varicoceles. Prevalence of varicocele may differ from race to race (4). Exact prevalence of varicocele among Sri Lankan male population is still not known.

Varicocele is an abnormal dilatation and tortuosity of the pampiniform venous plexus of the spermatic cord, chiefly affecting the internal spermatic vein and less commonly the cremasteric (external spermatic) vein (5). There are two types of varicocele: 1. the primary or idiopathic – the most common type, and 2 the secondary, due to kidney or retroperitoneal tumour, lymphadenopathy and hepatic congestion (6).

Normally, about 80% of varicoceles are unilateral, involve the pampiniform plexus of the left sided. Bilateral varicoceles are rare and account for about 15% of varicoceles. incidence of isolated right sided varicocele is the rarest (7).

Varicocele can be clinically classified in to three categories: First degree: tortuous and enlarged pampiniform venous plexus which is palpable only during the Valsalva manoeuvre. Second degree: tortuous and enlarged pampiniform venous plexus which is palpable only at upright position. Third degree: tortuous and enlarged pampiniform venous plexus which is visible as a bag of worms in any position (8). The non-palpable enlargement of the venous plexus, which can be detected only by assisted imaging techniques such as ultrasound, duplex Doppler or angiography , is defined as sub-clinical varicocele (9).

Assessment of males with a varicocele starts with a careful medical, surgical and reproductive history followed by a proper physical examination. The patients should be examined in both the recumbent and upright positions for the presence of tortuous dilated pampiniform plexus in both sides. Dilated varicoced pampiniform plexus feels as a "bag of worms". If the suspected varicocele is not detectable in normal upright position, the patient should be examined while performing a Valsalva Maneuver to detect first degree varicocele. Though it is not recommended to use ancillary investigating methods (Ultra sound scanning, Doppler scanning etc.) for routine diagnosis of varicocele (10), their value, specially ultrasound scanning in diagnosing sub-clinical varicocele, can not be disregarded. In bilateral and right sided varicocele, it is advisable to perform a abdominal ultrasound scanning to exclude other underline pathologies.

Though there are several theories postulated to explain the etiology of varicocele, non of them are not confirmed yet. Incompetence of the venous valves (11), hydro static pressure difference of the left testicular vein (12), increase nitric oxide in testicular veins (13) and increased blood flow of the testicular vasculature during puberty (14) are some of the theories suggested (15).

Varicocele causes testicular dysfunctions leading to abnormal Spermatogenesis (15). There are several theories, such as stasis of blood (16), increase testicular temperature (17), abnormalities of the testicular blood flow (18, 19), hypoxia and adrenal reflux (20), endocrine imbalance (21), accumulation of free radicals and abnormal apoptotic activities (22) have attempted to explain the correlation between abnormal testicular functions and varicocele. But non of them have been proven yet and it may be multi-factorial (23).

Correlation between presence of varicocele and seminal fluid parameter abnormalities is controversial. According to Xuj et. al., varicocele affects sperm motility, viability and morphology but concentration, volume and Ph(24). In 1990, Alli JI et al., observed that there is no significant deference of normal morphology between men with and without varicocele (25). But Mohommad A et al, in 2011 reported that sperm count and concentration both were deteriorated due to varicocele. Further, In 2009, Osiffo OD et al., observed low seminal fluid volume in males with varicoceles (27).

Role of Varicocelectomy, only available effective treatment for varicocele is still controversial (28, 29). In 2011 Abdillazes et al., clearly stated that " Although there is no conclusive evidence that a varicocele repair improves spontaneous pregnancy rates, varicocelectomy improves sperm parameters (count and total and progressive motility), reduces sperm DNA damage and seminal oxidative stress, and improves sperm ultramorphology". In latest European Guideline on Male Infertility also haven't recommended varicocelectomy as the management for varicocele.

There are very few studies done on varicocele, male fertility and effects of varicocelectomy on male fertility among Sri Lankan male population. Therefore RBL, MF – Karapitiya decided to conduct an audit on male patients who underwent varicocelectomy during the last 3 years.

METHODOLOGY

All the patients who came to the RBL with varicocele, during 2008 and 2011 were taken as the study population (Sampling technique was convenient sampling technique) . After obtaining there verbal or written consent for the research the patient who fulfilled the inclusive criteria were selected for the study. Inclusion criteria were as follows

1. Normal serum FSH, LH and testosterone levels
2. Testicular volume (of both testicles) more than 24 cc
3. Clinically detectable varicoceles which were conformed by the ultrasound scanning (diameter of pampiniform plexus more than 2 mm)
4. The males who were 40 years or below.

5. Males with primary sub – fertility

Pre-varicocelectomy SF analyses of participating males were done according to the WHO guidelines (30).

Tehey were then referred to the Professorial surgical unit of Karapitiya Medical Faculty for vericocelectomies. Varicocelectomies were performed by using the inguinal approach (Ivanissevich) by a single surgeon (31). Post-varic ocelectomy SF analysis were performed after 4 months using the same criteria as pre – operative SF analysis (WHO guidelines).

For the final assessment 37 patients were included.

RESULTS AND DISCUSSION

Most of the study population were from Gall (62%), Matara (18%) and Hambantota (11%) districts. The rest of the patients (09%) were from Kalutara, Ratnapura, Gampaha, Colombo and nuwaraeliya distrcts. The mean age of the study group was 35.4±4.66. The mean testicular volume was 12.9 ±1.3. The mean serum testosterone, LH and FSH levels of the study group were 3.8±0.8, 4.9±1.2 and 5.3±0.7 respectively.

Five (05; 15%) of them had bilateral varicoceles, 2 (8%) of them had right sided varicoceles and the rest, 32 (77%) had left sided varicoceles. In 1981, David C. Sypol has recorded 78% of left sided varicoceles, 2% to 20% of bilateral varicoceles and 1% to 7% of of right sided varicoceles among his study population (32). Our finding too are compatible with his findings.

The volume, Ph and number of bacteria present in the pre-operative samples were 1.86± 0.76, 7.8±0.47 and 1.7±0.6. The volume, Ph and number of bacteria present in the post – operative samples, four (04) months after varicocelectomies, were 1.9± 0.41, 7.5±0.34 and 1.7±0.62 respectively. We could not observe any significant deference between them and WHO normal criteria for seminal fluid analysis and also we could not observe any significant improvement of these parameters (volume, Ph and presence of bacteria) after varicocelectomy.

Motility of the Pre-operative samples was 17.5±9.3 and post-operative samples was 38.3±18.6. Progressivity of pre-operative and post-operative samples was 1.2±0.56 and 2.2±0.74 respectively. Viability of the Pre-operative samples was 24.8±10.57 and post-operative samples was 48.7±23.24. Concentration of the pre-operative samples was 5.4±3.5 while post-operative samples showed 18.86±12.9 and 16.3±5.3 was the normal morphology of the pre-operative samples. Normal morphology of post-operative samples was 33.3±16.2. According to these results, we observed improvements of Progressivity, concentration and morphology after varicocelectomies.

Eight (08) pregnancies (26%), five (04) by natural and three (04) by Intra Uterine Insemination (IUI) were reported among the partners of the patients who under went varicocelectomies within two (02) years of follow up.

CONCLUSIONS

Varicocelectomy appears to improve the SF parameter abnormalities and pregnancy rates.

A properly designed randomized control study is proposed.

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