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DECREASED SPERM CONCENTRATION AND MOTILITY IN A SUBPOPULATION OF VEGETARIAN MALES AT A DESIGNATED BLUE ZONE GEOGRAPHIC REGION.

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OBJECTIVE: Blue Zone regions identify demographic areas of the world where people have long life spans. This study was conducted in a Blue Zone region where vegetarians consume 3.5 servings of meat substitutes per week. There is a paucity of information on the association between vegetarian diet and male fertility. The premise was that semen parameters were affected by diet. The objective was to compare sperm characteristics of male infertility patients on vegetarian and non-vegetarian diets.

DESIGN: Retrospective study.

MATERIALS AND METHODS: Semen analyses were carried out in 474 males from 2009 to 2013. Patients categorized themselves as either lacto-ovo vegetarians (N = 26), vegans (N = 5) or non-vegetarians (N = 443). Exclusion criteria were microepididymal sperm aspiration, testicular extraction and donor cases. Parameters measured were concentration, progression, strict normal morphology, chromatin integrity, hyperactivation and zona-free hamster oocyte/sperm penetration assay (SPA) as described in the W.H.O. 5th Edition manual. A CASA system was used for analyzing motility parameters. Differences in means were tested using ANOVA and the Student's t-test, adjusted for unequal variance. Power for sample size tested was determined to be 74.7%.

RESULTS: Lacto-ovo vegetarians had significantly lower sperm concentration (50.7 ± 7.4 M/mL, mean \pm S.E.M.) when compared with non-vegetarians (69.6 ± 3.2 M/mL). Furthermore, total motility was lower in the lacto-ovo group ($33.2 \pm 3.8\%$ versus non-vegetarian $58.2 \pm 1.0\%$). Similarly, vegans had lower total motility ($51.8 \pm 13.4\%$) with a trend towards lower sperm concentration (51.0 ± 13.1 M/mL). Interestingly, hyperactive motility was lowest in the vegan group. The percent strict normal sperm morphology in all groups were within normal range. There were no differences in the remaining parameters: rapid progression, chromatin integrity and SPA capacitation index.

CONCLUSION: The results showed that the vegetarian diet reduced sperm concentration and motility but did not extend into the infertile range. The findings suggested that estrogenic compounds or chemical residues in the diet had a negative effect on sperm parameters. Hyperactive motility indicative of the CatSper calcium selective channel was compromised in the vegan group. Clinical management would include dietary supplements to offset deficiencies. More studies are needed to corroborate the present findings.

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