

## **Myo-Inositol to D-Chiro-Inositol ratio in follicular fluid plays a pivotal role for oocyte and embryo quality: summary of available evidence**

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Statement of the problem: follicular fluid (FF) microenvironment plays a key role for oocyte maturation and consequently, for embryo quality and fertilization rate. Accumulating evidence suggests that Myo-inositol (MI) level within the FF features a pivotal role in addressing the right folliculogenesis. Myo-inositol may be a member of the vitamin B-complex group. It's found during a big variety of foods including fresh fruits, beans, whole grains and seeds. Myo-inositol has been utilized in the treatment of diabetic neuropathy, depression, Alzheimer's disease, anxiety disorder and polycystic ovary syndrome. Inositol is employed for diabetic nerve pain, anxiety disorder, high cholesterol, insomnia, cancer, depression, schizophrenia, Alzheimer's disease, attention deficit-hyperactivity disorder (ADHD), autism, promoting hair growth, a skin disease called psoriasis, and treating side effects of medical treatment with lithium. For anyone who struggles with PCOS or isn't ovulating regularly, studies have found taking myo-inositol may help regulate your cycles and obtain you pregnant faster. Myo-inositol improves insulin sensitivity and should be beneficial to patients especially with ovulatory infertility. Myo-inositol may be a supplement which will cause weight loss in women with PCOS. Inositol may be a compound associated with B vitamins that helps improve insulin sensitivity. Myo-inositol (MI) is one stereoisomer of a C6 sugar alcohol that belongs to the inositol family. It's the precursor of inositol triphosphate, acting as an intracellular second messenger and regulating variety of hormones like thyrotropin, FSH (FSH) and insulin. Inositol may be a vitamin-like substance. It's found in many plants and animals. It's also produced within the physical body and may be made during a laboratory. Inositol are often found in many forms (called isomers). The foremost common forms are myo-inositol and D-chiro-inositol. Inositol is employed to for metabolic syndrome and polycystic ovary syndrome (PCOS). It is also used for several other conditions, but there's no good scientific evidence to support most of those uses. Inositol might balance certain chemicals within the body to possibly help with mental conditions like anxiety disorder, depression, and obsessive-compulsive disorder. It'd also help insulin work better. This might help with conditions like polycystic ovary syndrome or diabetes during pregnancy. D-chiro-Inositol formerly D-chiro-inositol, commonly abbreviated DCI) may be a member of a family of related substances often mentioned collectively as "inositol", although that term encompasses several isomers of questionable biological relevance, including L-chiro-inositol. Myo-Inositol is converted into DCI by an insulin dependent NAD/NADH epimerase enzyme. It is known to be a crucial secondary messenger in insulin signal transduction. DCI accelerates the dephosphorylation of glycogen synthase and pyruvate dehydrogenase, rate limiting enzymes of non-oxidative and oxidative glucose disposal. DCI may act to bypass defective normal epimerization of myo-inositol to DCI related to insulin resistance and a minimum of partially restore insulin sensitivity and glucose disposal. Summary Myo-inositol and carnitine supplements may help women with PCOS reduce and control certain symptoms. Inositol consists of nine stereo isomeric forms, all having a 6-carbon ring with a hydroxyl attached to every carbon: two of those isoforms, MI and D-Chiro-Inositol (DCI), have the foremost important role for human reproduction. Especially, DCI is obtained by epimerization of MI, which is that the most abundant isoform. This enzymatic reaction is controlled by

insulin and depends on specific tissue necessities. Within the ovary, MI is involved in glucose uptake and FSH signalling. In insulin-resistant women suffering from polycystic ovary syndrome (PCOS) there's a severe dysbalance of the MI/DCI ratio in FF: these women showed an enhanced MI to DCI epimerization within the ovary, resulting in MI deficiency that impairs FSH signalling, leading to reduced oocyte quality. especially , recent studies found that MI-DCI ratio in FF dropped from 100:1 in healthy women to 0.2:1 in patients with PCOS who additionally displayed significantly higher levels of insulin resistance, hyperinsulinemia, and LH . Additionally, other authors found that increasing doses of orally administered DCI were significantly related to high number of immature oocytes and low number of grade I embryo. Finally, a recent study showed that a high ratio of MI/DCI in FF is in a position to extend quality of blastocysts and IVF outcomes.

**Conclusion & Significance:** MI/DCI ratio in FF plays a pivotal role for oocyte and embryo quality