

Obstetrics & Gynecology Science

Ahmed Abu-Zaid, et al. ALA and PCOS

Supplementary Material 1. The search strategy and databases syntaxes

Groups	Descriptors	Number of studies reached
Outcome	Polycystic Ovary Syndrome OR Ovary Syndrome, Polycystic OR Syndrome, Polycystic Ovary OR Polycystic ovary disease OR Stein-Leventhal Syndrome OR Stein Leventhal Syndrome OR Syndrome, Stein-Leventhal OR Sclerocystic Ovarian Degeneration OR Ovarian Degeneration, Sclerocystic OR Sclerocystic Ovary Syndrome OR Polycystic Ovarian Syndrome OR Ovarian Syndrome, Polycystic OR Polycystic Ovary Syndrome 1 OR Sclerocystic Ovaries OR Ovary, Sclerocystic OR Sclerocystic Ovary OR hyperandrogenism OR Hypertrichosis OR Hirsutism OR "PCOS" OR "PCO"	
Exposure	Alpha-Lipoic Acid OR Lipoic Acid OR Thioctic Acid OR Inositol OR myo-inositol OR D-chiro-inositol	
Setting	Randomized controlled trial OR controlled clinical trial OR randomized controlled trials OR random allocation OR double blind method OR single blind method OR clinical trial OR clinical trials OR placebos OR placebo OR random	
PubMed	Number of localized studies: 116 Limits: humans Number of studies after applying limits: 106	
#1	((((((((((((((("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("ovary"[All Fields] AND "syndrome"[All Fields] AND "polycystic"[All Fields]))) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("polycystic ovary syndrome"[All Fields] AND "disease"[All Fields]) OR "polycystic ovary disease"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("stein"[All Fields] AND "leventhal"[All Fields] AND "syndrome"[All Fields]) OR "stein leventhal syndrome"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("stein"[All Fields] AND "leventhal"[All Fields] AND "syndrome"[All Fields]) OR "stein leventhal syndrome"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("syndrome"[All Fields] AND "stein"[All Fields] AND "leventhal"[All Fields]))) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("sclerocystic"[All Fields] AND "ovarian"[All Fields] AND "degeneration"[All Fields]) OR "sclerocystic ovarian degeneration"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields] AND "degeneration"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("ovarian"[All Fields] AND "degeneration"[All Fields] AND "sclerocystic"[All Fields])) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("sclerocystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "sclerocystic ovary syndrome"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("polycystic ovarian syndrome"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("ovarian"[All Fields] AND "syndrome"[All Fields] AND "polycystic"[All Fields])) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR "polycystic ovary syndrome 1"[All Fields])) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("sclerocystic"[All Fields] AND "ovaries"[All Fields]) OR "sclerocystic ovaries"[All Fields]) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("ovary"[All Fields] AND "sclerocystic"[All Fields])) OR ("polycystic ovary syndrome"[MeSH Terms] OR ("polycystic"[All Fields] AND "ovary"[All Fields] AND "syndrome"[All Fields]) OR "polycystic ovary syndrome"[All Fields] OR ("sclerocystic"[All Fields] AND "ovary"[All Fields]) OR "sclerocystic ovary"[All Fields]) OR ("hyperandrogenism"[MeSH Terms] OR "hyperandrogenism"[All Fields]) OR ("hypertrichosis"[MeSH Terms] OR "hypertrichosis"[All Fields]) OR ("hirsutism"[MeSH Terms] OR "hirsutism"[All Fields]) OR PCOS[All Fields] OR PCO[All Fields]	38,007

Supplementary Material 1. The search strategy and databases syntaxes (Continued)

Groups	Descriptors	Number of studies reached
#2	"thioctic acid"[MeSH Terms] OR ("thioctic"[All Fields] AND "acid"[All Fields]) OR "thioctic acid"[All Fields] OR ("alpha"[All Fields] AND "lipoic"[All Fields] AND "acid"[All Fields]) OR "alpha lipoic acid"[All Fields] OR ("thioctic acid"[MeSH Terms] OR ("thioctic"[All Fields] AND "acid"[All Fields]) OR "thioctic acid"[All Fields] OR ("lipoic"[All Fields] AND "acid"[All Fields]) OR "lipoic acid"[All Fields]) OR ("thioctic acid"[MeSH Terms] OR ("thioctic"[All Fields] AND "acid"[All Fields]) OR "thioctic acid"[All Fields] OR ("inositol"[MeSH Terms] OR "inositol"[All Fields] OR "inositols"[All Fields]) OR ("inositol"[MeSH Terms] OR "inositol"[All Fields] OR ("myo"[All Fields] AND "inositol"[All Fields]) OR "myo inositol"[All Fields]) OR "D-chiro-inositol"[All Fields]	56,311
#3	(((((("Randomized Controlled Trial"[Publication Type] OR "Controlled Clinical Trial"[Publication Type]) OR "Randomized Controlled Trials as Topic"[Mesh]) OR "Random Allocation"[Mesh]) OR "Double-Blind Method"[Mesh]) OR "Single-Blind Method"[Mesh]) OR "Clinical Trial"[Publication Type]) OR ("clinical trial"[Publication Type] OR "clinical trials as topic"[MeSH Terms] OR "clinical trials"[All Fields])) OR "Placebos"[Mesh]) OR ("placebos"[MeSH Terms] OR "placebos"[All Fields] OR "placebo"[All Fields])) OR ("random allocation"[MeSH Terms] OR "random"[All Fields] AND "allocation"[All Fields]) OR "random allocation"[All Fields] OR "random"[All Fields])	1,965,231
#4	#1 AND #2 AND #3	116
Web of Science	Number of localized studies: 4 Limits: documents types (articles) Number of studies after applying limits: 4	
#1	TS=("Polycystic Ovary Syndrome") OR TS=("Ovary Syndrome, Polycystic") OR TS=("Syndrome, Polycystic Ovary") OR TS=("Polycystic ovary disease") OR TS=("Stein-Leventhal Syndrome") OR TS=("Stein Leventhal Syndrome") AND TS=("Syndrome, Stein-Leventhal") OR TS=("Sclerocystic Ovarian Degeneration") OR TS=("Ovarian Degeneration, Sclerocystic") OR TS=("Sclerocystic Ovary Syndrome") OR TS=("Polycystic Ovarian Syndrome") AND TS=("Ovarian Syndrome, Polycystic") OR TS=("Polycystic Ovary Syndrome 1") OR TS=("Sclerocystic Ovaries") OR TS=("Ovary, Sclerocystic") OR TS=("Sclerocystic Ovary") OR TS=("hyperandrogenism") OR TS=("Hypertrichosis") OR TS=("Hirsutism") OR TS=("PCOS") OR TS=("PCO")	1,259
#2	TS=("Alpha-Lipoic Acid") OR TS=("Lipoic Acid") OR TS=("Thioctic Acid") OR TS=("Inositol") OR TS=("myo-inositol") OR TS=("D-chiro-inositol")	422
#3	TS=(Randomized controlled trial) OR TS=(controlled clinical trial) OR TS=(randomized controlled trials) OR TS=(random allocation) OR TS=(double blind method) OR TS=(single blind method) OR TS=(clinical trial) OR TS=(clinical trials) OR TS=(placebos) OR TS=(placebo) OR TS=(random)	243,389
#4	#1 AND #2 AND #3	4
SCOPUS	Number of localized studies: 272 Limits: document type (article and article in press) Number of studies after applying limits: 130	
#1	(TITLE-ABS-KEY (hypertrichosis)) OR (TITLE-ABS-KEY (hirsutism)) OR (TITLE-ABS-KEY (pcos)) OR (TITLE-ABS-KEY (pco)) OR ((TITLE-ABS-KEY (polycystic AND ovary AND syndrome)) OR (TITLE-ABS-KEY (ovary AND syndrome, AND polycystic)) OR (TITLE-ABS-KEY (syndrome, AND polycystic AND ovary)) OR (TITLE-ABS-KEY (polycystic AND ovary AND disease)) OR (TITLE-ABS-KEY (stein-leventhal AND syndrome)) OR (TITLE-ABS-KEY (stein AND leventhal AND syndrome))) OR ((TITLE-ABS-KEY (syndrome, AND stein-leventhal)) OR (TITLE-ABS-KEY (sclerocystic AND ovarian AND degeneration)) OR (TITLE-ABS-KEY (ovarian AND degeneration, AND sclerocystic)) OR (TITLE-ABS-KEY (sclerocystic AND ovary AND syndrome)) OR (TITLE-ABS-KEY (polycystic AND ovarian AND syndrome)) OR (TITLE-ABS-KEY (ovarian AND syndrome, AND polycystic)) OR ((TITLE-ABS-KEY (polycystic AND ovary AND syndrome 1)) OR (TITLE-ABS-KEY (sclerocystic AND ovaries)) OR (TITLE-ABS-KEY (ovary, AND sclerocystic)) OR (TITLE-ABS-KEY (sclerocystic AND ovary)) OR (TITLE-ABS-KEY (hyperandrogenism)) OR (TITLE-ABS-KEY (hypertrichosis)))	62,222

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Supplementary Material 1. The search strategy and databases syntaxes (Continued)

Groups	Descriptors	Number of studies reached
#2	(TITLE-ABS-KEY (d-chiro-inositol)) OR (TITLE-ABS-KEY (myo-inositol)) OR (TITLE-ABS-KEY (inositol)) OR (TITLE-ABS-KEY (thioctic AND acid)) OR (TITLE-ABS-KEY (lipoic AND acid)) OR (TITLE-ABS-KEY (alpha-lipoic AND acid))	74,528
#3	(TITLE-ABS-KEY (randomized AND controlled AND trial) OR TITLE-ABS-KEY (controlled AND clinical AND trial) OR TITLE-ABS-KEY (randomized AND controlled AND trials) OR TITLE-ABS-KEY (random AND allocation) OR TITLE-ABS-KEY (double AND blind AND method) OR TITLE-ABS-KEY (single AND blind AND method) OR TITLE-ABS-KEY (clinical AND trial) OR TITLE-ABS-KEY (clinical AND trials) OR TITLE-ABS-KEY (placebos) OR TITLE-ABS-KEY (placebo) OR TITLE-ABS-KEY (random))	3,747,753
#4	#1 AND #2 AND #3	272
Cochrane	Number of localized studies: 163 Limits: trials Number of studies after applying limits: 161	
#1	Me ("Polycystic Ovary Syndrome"):ti,ab,kw or ("Ovary Syndrome, Polycystic"):ti,ab,kw or ("Syndrome, Polycystic Ovary"):ti,ab,kw or ("Polycystic ovary disease"):ti,ab,kw or ("Stein-Leventhal Syndrome"):ti,ab,kw or ("Stein Leventhal Syndrome"):ti,ab,kw or ("Syndrome, Stein-Leventhal"):ti,ab,kw or ("Sclerocystic Ovarian Degeneration"):ti,ab,kw or ("Ovarian Degeneration, Sclerocystic"):ti,ab,kw or ("Sclerocystic Ovary Syndrome"):ti,ab,kw or ("Polycystic Ovarian Syndrome"):ti,ab,kw or ("Ovarian Syndrome, Polycystic"):ti,ab,kw or ("Polycystic Ovary Syndrome 1"):ti,ab,kw or ("Sclerocystic Ovaries"):ti,ab,kw or ("Ovary, Sclerocystic"):ti,ab,kw or ("Sclerocystic Ovary"):ti,ab,kw or ("hyperandrogenism"):ti,ab,kw or ("Hypertrichosis"):ti,ab,kw or ("Hirsutism"):ti,ab,kw or ("PCOS"):ti,ab,kw or ("PCO"):ti,ab,kw	5,521
#2	Me ("Alpha-Lipoic Acid") or ("Lipoic Acid"):ti,ab,kw or ("Thioctic Acid"):ti,ab,kw or ("Inositol"):ti,ab,kw or ("myo-inositol"):ti,ab,kw or ("D-chiro-inositol"):ti,ab,kw	1,783
#3	#1 AND #2	163
EMBASE	Number of localized studies: 307 Limits: no limits	
#1	(polycystic AND ('ovary'/exp OR ovary) AND ('syndrome'/exp OR syndrome)) OR (('ovary'/exp OR ovary) AND syndrome, AND polycystic OR (syndrome, AND polycystic AND ('ovary'/exp OR ovary)) OR (polycystic AND ('ovary'/exp OR ovary) AND ('disease'/exp OR disease)) OR ('stein leventhal' AND ('syndrome'/exp OR syndrome)) OR (stein AND leventhal AND ('syndrome'/exp OR syndrome)) OR (syndrome, AND 'stein leventhal') OR (sclerocystic AND ovarian AND ('degeneration'/exp OR degeneration)) OR (ovarian AND degeneration, AND sclerocystic) OR (sclerocystic AND ('ovary'/exp OR ovary) AND ('syndrome'/exp OR syndrome)) OR (polycystic AND ovarian AND ('syndrome'/exp OR syndrome)) OR (ovarian AND syndrome, AND polycystic) OR (polycystic AND ('ovary'/exp OR ovary) AND ('syndrome'/exp OR syndrome) AND 1) OR (sclerocystic AND ('ovaries'/exp OR ovaries)) OR (ovary, AND sclerocystic) OR (sclerocystic AND ('ovary'/exp OR ovary)) OR ('hyperandrogenism'/exp OR hyperandrogenism) OR ('hypertrichosis'/exp OR hypertrichosis) OR ('hirsutism'/exp OR hirsutism) OR (pcos) OR (pco)	79,540
#2	'alpha lipoic' AND ('acid'/exp OR acid) OR (lipoic AND ('acid'/exp OR acid)) OR 'thioctic acid' OR 'inositol' OR 'myo inositol' OR 'd chiro inositol'	71,032
#3	(randomized AND controlled AND ('trial'/exp OR trial)) OR (controlled AND ('clinical'/exp OR clinical) AND ('trial'/exp OR trial)) OR (randomized AND controlled AND trials) OR (random AND allocation) OR (double AND ('blind'/exp OR blind) AND ('method'/exp OR method)) OR (single AND ('blind'/exp OR blind) AND ('method'/exp OR method)) OR (('clinical'/exp OR clinical) AND ('trial'/exp OR trial)) OR (('clinical'/exp OR clinical) AND trials) OR ('placebos'/exp OR placebos) OR ('placebo'/exp OR placebo) OR (random)	3,310,028
#4	#1 AND #2 AND #3	307

Excluded articles

Study	Reason
1 Artini et al. [1] (2020)	Not randomized controlled trial (RCT)
2 Bankole [2] (2022)	Not RCT
3 Canosa et al. [3] (2020)	No related variables
4 De Cicco et al. [4] (2017)	Not RCT
5 Cirillo et al. [5] (2020)	No enough information
6 Fruzzetti et al. [6] (2020)	Not RCT
7 Genazzani et al. [7] (2014)	Not RCT
8 Genazzani et al. [8] (2018)	Not RCT
9 Cassani et al. [9] (2019)	Not RCT
10 Malvasi et al. [10] (2022)	Not RCT
11 Masharani et al. [11] (2010)	Not RCT

Supplementary References

1. Artini PG, Obino MER, Micelli E, Malacarne E, Vacca C, Papini F, et al. Effect of d-chiro-inositol and alpha-lipoic acid combination on COH outcomes in overweight/obese PCOS women. *Gynecol Endocrinol* 2020;36:755-9.
2. Bankole IB. The role of alpha lipoic acid and olive oil on metabolic syndrome associated with letrozole-induced polycystic ovarian syndrome [Internet]. DSpace Repository; c2022 [cited 2023 May 15]. Available from: <http://ir.mtu.edu.ng/xmlui/handle/123456789/1157>.
3. Canosa S, Paschero C, Carosso A, Leoncini S, Mercaldo N, Gennarelli G, et al. Effect of a combination of myo-inositol, alpha-lipoic acid, and folic acid on oocyte morphology and embryo morphokinetics in non-PCOS overweight/obese patients undergoing IVF: a pilot, prospective, randomized study. *J Clin Med* 2020;9:2949.
4. De Cicco S, Immediata V, Romualdi D, Policola C, Tropea A, Di Florio C, et al. Myoinositol combined with alpha-lipoic acid may improve the clinical and endocrine features of polycystic ovary syndrome through an insulin-independent action. *Gynecol Endocrinol* 2017;33:698-701.
5. Cirillo F, Catellani C, Lazzeroni P, Sartori C, Tridenti G, Vezzani C, et al. HMGB1 is increased in adolescents with polycystic ovary syndrome (PCOS) and decreases after treatment with myo-inositol (MYO) in combination with alpha-lipoic acid (ALA). *Gynecol Endocrinol* 2020;36:588-93.
6. Fruzzetti F, Fidecicchi T, Palla G, Gambacciani M. Long-term treatment with α -lipoic acid and myo-inositol positively affects clinical and metabolic features of polycystic ovary syndrome. *Gynecol Endocrinol* 2020;36:152-5.
7. Genazzani A, Despini G, Santagni S, Prati A, Rattighieri E, Chierchia E, et al. Effects of a combination of alpha lipoic acid and myo-inositol on insulin dynamics in overweight/obese patients with PCOS. *Endocrinol Metab Syndr* 2014;3:1-7.
8. Genazzani AD, Shefer K, Della Casa D, Prati A, Napolitano A, Manzo A, et al. Modulatory effects of alpha-lipoic acid (ALA) administration on insulin sensitivity in obese PCOS patients. *J Endocrinol Invest* 2018;41:583-90.
9. Cassani C, Musicò G, Peri A, Pugliese L, Nappi RE, Spinillo A. A case of Allen-Masters syndrome in an early pregnant woman: laparoscopic barbed suture repair of an internal small bowel obstruction due to a broad ligament hernia. *Eur J Obstet Gynecol Reprod Biol* 2019;1:27-8.
10. Malvasi A, Tinelli A, Lupica G, Vimercati A, Spyropoulou K, Dellino M, et al. Effects of a combination of resveratrol and alpha-lipoic acid on body weight and adipose composition in women with PCOS: a preliminary pilot study. *Eur Rev Med Pharmacol Sci* 2022;26:6578-82.
11. Masharani U, Gjerde C, Evans JL, Youngren JF, Goldfine ID. Effects of controlled-release alpha lipoic acid in lean, nondiabetic patients with polycystic ovary syndrome. *J Diabetes Sci Technol* 2010;4:359-64.