
Bibliography

Adashi EY, Hsueh EJW, Yen SSC (1985), Insulin enhancement of leutinizing hormone and follicle-stimulating hormone releasing by cultured pituitary cell. *Endocrinol* 180: 1441-1446.

Agarwal A, Deepinder F, Sharma RK, Ranga G, Li J (2008), Effect of cell phone usage on semen analysis in men attending infertility clinic: an observational study. *Fertil Steril* 89: 124-128.

Agarwal A, Nallella KP, Allamaneni SS, Said TM (2004), Role of antioxidants in treatment of male infertility: an overview of the literature. *Reprod Biomed Online* 8: 616-627.

Agarwal A, Said TM (2003), Role of sperm chromatin abnormalities and DNA damage in male infertility. *Hum Reprod Update* 9: 331-345.

Agarwal A, Virk G, Ong C, Plessis SS (2014), Effect of oxidative stress on male reproduction. *World J Mens Health* 32: 1-17.

Aitken RJ, Baker MA (2013), Causes and consequences of apoptosis in spermatozoa; contributions to infertility and impacts on development. *Int J Dev Biol* 57: 265-272.

Aitken RJ, Koppers AJ (2011), Apoptosis and DNA damage in human spermatozoa. *Asian J Androl* 13: 36-42.

Ali EHA (2008), Protective Effects of echinacea on cyproterone acetate induced liver damage in male rats. *Pak J Biol Sci* 11; 2464-2471.

Ara N, Nakkanong K, Lv Wi, Yang J (2013), Antioxidant enzymatic activities and gene expression associated with heat tolerance in the stems and roots of two cucurbit species (“*Cucurbita maxima*” and “*Cucurbita moschata*”) and their interspecific inbred line “Maxchata”. *Int J Mol Sci* 14: 24008-24028.

Badouard C, Menezo Y, Panteix G, Ravanat JL, Douki T, Cadet J (2008), Determination of new types of DNA lesions in human sperm. *Zygote* 16: 9-13.

-
- Baker PJ**, O'shaughnessy PJ (2001), Role of gonadotrophins in regulating numbers of Leydig and Sertoli cells during fetal and post-natal development in mice. *Reprod* 23: 122-127.
- Ballester J**, Munoz MC, Dominguez J, Rigau T, Guinovart JJ, Gil JER (2004), Insulin-dependent diabetes affects testicular function by FSH and LH-linked mechanisms. *J Androl* 25: 706-711.
- Bansal AK**, Bilaspuri GS (2011), Impacts of oxidative stress and antioxidants on semen functions. *Vet Med Int* 2011: 1-7.
- Barkey RJ**, Wiss-Messer E, Hacham H, Herscovich S, Ber R, Amit T (1994), Prolactine and testicular Leydig cell function: Characterization of prolactine receptor in the murine MA 10 testicular Leydig cell line. *Proc Soc Exp Biol Med* 206: 243-247.
- Beers RF**, Sizer IW (1952), A spectrophotometric method for measuring the breakdown of hydrogen peroxide by catalase. *J Biol Chem* 195: 133-140.
- Berry MN**, Halls HJ, Grivell MB (1992), Techniques for the pharmacological and toxicological studies with isolated hepatocyte suspension. *Life Sci* 51: 213-218.
- Bhasin S**, Cunningham GR, Hayes FJ, Alvin MM, Peter JS (2006), Testosterone therapy in adult men with androgen deficiency syndromes: an endocrine society clinical practice guideline. *J Clin Endocrinol Metab* 91: 1995-2010.
- Bolumar F**, Olsen J, Rebagliato M, Sáez-Lloret I, Bisanti L (2000), Body mass index and delayed conception: a European Multicenter Study on Infertility and Subfecundity. *Am J Epidemiol* 151: 1072-1079.
- Brady AC** (1951), Biosynthesis of radioactive testosterone *in vitro*. *J Biol Chem* 193: 145-150.
- Burger HG** (2002), Androgen production in women. *Fertil Steril* 4: 3-5.
- Burton GJ** (2011), Oxidative stress. *Best Pract Res Clin Obstet Gynaecol* 25: 287-299.

-
- Carlsen E**, Giwercman A, Keiding N, Skakkebaek NE (1992), Evidence for decreasing quality of semen during past 50 years. *BMJ* 305: 609-613.
- Chaudhury AK**, Steinberger E (1975), Quantitative study of the effect of heat on the germinal epithelium on rat testis. *Am J Anat* 115: 509-513.
- Chemes HE**, Dym M, Madhwa Raj HG (1979), Hormonal regulation of sertoli cell differentiation. *Biol Reprod* 21: 251-255.
- Chen SJ**, Allam JP, Duan YG, Haidl G (2013), Influence of reactive oxygen species on human sperm functions and fertilizing capacity including therapeutical approaches. *Arch Gynecol Obstet* 288: 191-199.
- Choi MH**, Jin RO, Yang ND, Taneja R (2016), Oxidative stress mediated skeletal muscle degeneration: Molecules, mechanisms, and therapies. *Oxid Med Cell Longev* 2016: 684-694.
- Choudhary R**, Chawala VK, Soni ND, Kumar J, Vyas RK (2010), Oxidative stress and role of antioxidants in male infertility. *Pak J Physiol* 6: 54-59.
- Clermont Y** (1986), The cycle of seminiferous epithelium in man. *Am J Anat* 112: 35-41.
- Clermont Y**, Harvey SC (1967), Effects of hormones on spermatogenesis in the rat. *Ciba found colloq. Endocrinol* 16: 173-177.
- Clermont Y**, Leblond CP, Messier B (1959), Duree de cycle Qe 1' epithelium seminal der rat. *Arch Anat Micr Morph Exp* 48: 37-41.
- Collodel G**, Moretti E, Fontani V, Rinaldi S, Aravagli L (2008), Effect of emotional stress on sperm quality. *Indian J Med Res* 128: 254-261.
- Cosola C**, Sabatino A, Bari I, Fiaccadori E, Gesualdo L (2018), Nutrients, Nutraceuticals, and Xenobiotics Affecting Renal Health. *Nutrients* 10: 808-816.
- Cousineau TM**, Domar AD (2007). Psychological impact of infertility. *Best Pract Res Clin Obstet Gynaecol* 21: 293-308.
- Cozzolino DJ**, Lipshultz LI (2001), Varicocele as a progressive lesion: positive effect of varicocele repair. *Hum Reprod Update* 7: 55-58.

-
- Curtis KM**, Savitz DA, Arbuckle TE (1997), Effects of cigarette smoking, caffeine consumption, and alcohol intake on fecundability. *Am J Epidemiol* 146: 32-41.
- Voogt de HJ** (1992), The position of cyproterone acetate (CPA), a steroidal anti-androgen, in the treatment of prostate cancer. *Prostate Suppl* 4: 91-95.
- Desai SA**, mani UV, Lyer UM (2002), Serum lipids, apolipoproteins and total antioxidant activity levels of obese, diabetic and hypertensive subjects in an industrial set up in Baroda, Gujrat, India. *Int J Diabetes Dev Ctries* 22: 91-99.
- Dohle GR**, Diemer T, Giwercman A, Jungwirth A, Kopa Z, Krausz C (2010). Guidelines of male infertility. *Eur Urol*: 1-46.
- Dufau ML**, Charreau EH, Catt KJ (1973), Characteristics of soluble gonadotrophin receptors from the rat testis. *J Biol Chem* 248: 6973-6978.
- Durairajanayagam D** (2018), Lifestyle causes of male infertility. *Arab J Urol* 16: 10-20.
- Durairajanayagam D**, Agarwal A, Ong C, Prashast P (2014), Lycopene and infertility. *Asian J Androl* 16: 420-425.
- Eddy EM** (1988), The spermatozoon. In: The physiology of reproduction. Knobil E, Neill J (Eds). New York, Raven Press, 1-27.
- El-Raey MA**, Ibrahim GE, Eldahshan OA (2013), Lycopene and lutein: a review for their chemistry and medicinal uses. *J Pharmacogn Phytochem* 2: 245-254.
- El-Raey MA**, Ibrahim GE, Eldahshan OA (2013), Lycopene and lutein: a review for their chemistry and medicinal uses. *J Pharmacogn Phytochem* 2: 245-254.
- Emanuele MA**, Emanuele NV (1998), Alcohol's effects on male reproduction. *Alcohol Health & Res World* 22: 195-201.
- Esteves SC** (2002), Effect of cigarette smoking on levels of seminal oxidative stress in infertile men: a prospective study. *Int Braz J Urol* 28: 484-485.

-
- Feldman HA**, Goldstein I, Hatzichristou DG, Krane RJ, McKinlay JB (1994), Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. *J Urol* 151: 54-61.
- Fogh M**, Corker CS, Hunter WM, McLean H, Philip J, Schou G, Skakkebaek NE (1979), The effects of low doses of cyproterone acetate on some functions of the reproductive system in normal men. *Acta Endocrinol* 91: 545-552.
- Frank O** (1983), Infertility in Sub-Saharan Africa: Estimates and Implications. *Popul Dev Rev* 9: 137-44.
- Fredricsson B**, Carlstrom K (1981), Effect of low doses of cyproterone acetate on sperm morphology and some other parameters of reproduction in normal men. *Andrologia* 13: 369-375.
- Friedwald WT**, Levy KJ, Fredereckson DS (1972), Estimation of concentration of LDL in plasma without preparative ultra centrifuse. *Clin Chem* 18: 499-502.
- Gao J**, Mahto A (2016), Anti-androgen therapy in female adult acne. *J Dermatol Res Ther* 2: 1-3.
- Gao W**, Po Y, Luo KQ (2001), Temporal relationship between cytochrome-c release and mitochondrial swelling during UV- induced apoptosis in living Hela cells. *J Cell Sci* 114: 2855-2862.
- Garner DL**, Thomas CA, Joerg HW (1997), Fluorometric assessments of mitochondrial function and viability in cryopreserved bovine spermatozoa. *Biol Reprod* 57: 1401-1406.
- Gharagozloo P**, Aitken RJ (2011), The role of sperm oxidative stress in male infertility and the significant oral antioxidant therapy. *Hum Reprod* 26: 1628-1640.
- Ghosh A**, Jana K, Ali KM, De D, Chatterjee K, Ghosh, D (2014), Corrective role of *Eugenia jambolana* on testicular impairment in streptozotocin-induced diabetic male albino rat: an approach through genomic and proteomic study. *Andrologia* 46: 296–307.

-
- Giahi L**, Mohammadmoradi S, Javidan A, Sadeghi MR (2016), Nutritional modifications in male infertility: a systematic review covering 2 decades. *Nutr Rev* 74: 118-130.
- Gonzalez-Marin C**, Gosalvez J, Roy R (2012), Types, causes, detection and repair of DNA fragmentation in animal and human sperm cells. *Int J Mol Sci* 13: 14026-14052.
- Gopalkrishnan K** (1991), Standardized procedures in human semen analysis. *Curr Sci* 25: 353-402.
- Graeff FG**, Junior HZ (2010), The hypothalamic-pituitary-adrenal axis and panic. *J Neurosci* 3: 3-8.
- Griffin JE**, Wilson JD (1998), Disorders of the testis and the male reproductive tract. In Williams Textbook of Endocrinology. Wilson ZE, Foster DW, Kronenberg HM, Larsen PR (Eds). Philadelphia, W.B. Saunders Company, 745-819.
- Griveau JF**, Lannou LD (1994), Effects of antioxidants on human sperm preparation techniques. *Int J Androl* 17: 225-231.
- Gunasekar PG**, Kumaran B, Govindarajulu P (2008), Prolactin and Leydig cell steroidogenic enzymes in the bonnet monkey (*Macaca radiata*). *Int J Androl* 11: 53-58.
- Haider S**, Rai U (1986), Effects of cyproterone acetate and flutamide on the testis and epididymis of the Indian wall lizard, *Hemidactylus flaviviridis* (Ruppell). *Gen Com Endocrinol* 64: 321-329.
- Hall PF**, Eik-Nes KB (1962), The influence of gonadotrophins in vivo upon the biosynthesis of androgens by homogenate of rat testis. *Biochem Biophys Acta* 71: 438-445.
- Hamilton GS**, Kennedy TG, Karlik SJ (1994), Early identification of sites of embryo implantation in rats by means of gadolinium-enhanced MR imaging. *JMRI* 4: 481-484.
- Hampl R**, Drabkova P, Kandar R, Stepan J (2012), Impact of oxidative stress on male infertility. *Ceska Gynekol* 77: 241-245.
- He Z**, Kokkinaki M, Dym M, Zuping HE, Maria K, Martin D (2009), Signaling molecules and pathways regulating the fate of spermatogonial stem cells. *Micro Res Tech* 72: 586-592.

-
- Hebig WH**, Pabst MJ, Jakoby WB (1974), Glutathione-S-transferase. The first enzymatic step in mercapturic acid formation. *J Biol Chem* 249: 7130-7139.
- Hedger MP**, Kretser DM (2000), Leydig cell function and its regulation. *Results Probl Cell Differ* 28: 69-73.
- Heinlein AC**, Chang C (2002), The roles of androgen receptor and androgen binding protein in nongenomic androgen action. *Mol Endocrinol* 18: 2181-2187.
- Heinz F**, Lamprecht W, Kirsch J (1968), Enzymes of fructose metabolism in human liver. *J Clin Invest* 47: 1826-1832
- Henkel RR** (2011), Leukocytes and oxidative stress: dilemma for sperm function and male fertility. *Asian J Androl* 13: 43-52.
- Hennebert O**, Chalbot S, Alran S, Morfin R (2007), Dehydroepiandrosterone 7 α hydroxylation in human tissues: Possible interference with type 1 11 β -hydroxysteroid dehydrogenase-mediated processes. *J Steroid Biochem Mol Bio* 104: 326-333.
- Henry RJ**, Chiamori M, Golub OJ, Berkman S (1960), Revised spectrophotometric methods for the determination of glutamate oxaloacetate transaminase, glutamic pyruvate transaminase and lactic acid dehydrogenase. *Am J Clin Pathol* 34: 381-398.
- Horecker BL** (1966), Alkaline phosphatase. In: *Methods of Enzymology*. In: Horecker BL (Eds). Academic Press, New York, 639-642.
- Inhorn MC**, King L, Nriagu JO, Kobeissi L, Hammoud N (2008), Occupational and environmental exposures to heavy metals: risk factors for male infertility in Lebanon?. *Reprod Toxicol* 25: 203-212.
- Islamian JP**, Mehrali H (2015), Lycopene as A Carotenoid Provides Radioprotectant and Antioxidant Effects by Quenching Radiation-Induced Free Radical Singlet Oxygen: An Overview. *Cell J* 16: 386-391.

-
- Jamin N**, Ostuni MA, Vu TK, Yao ZX, Murail S, Robert JC, Giatzakis C, Papadopoulos V (2005), Characterization of the cholesterol recognition amino acid consensus sequence of the perip. *Mol Endocrinol* 19: 588-591.
- Jarabak J**, Adams JA, Williams-Ashman HG, Talalay P (1962), Purification of 17 β -hydroxysteroid dehydrogenase of human placenta and studies on its transdehydrogenase function. *J Biol Chem* 237: 345-357.
- Jayendran RS**, Van der Ven HH, Perez-pelaez M, Crabo BG, Zaneveld LJD (1984), Development of an assay to assess the function integrity of the human sperm membrane and its relationship to other semen characteristics. *J Reprod Fertil* 70: 219-228.
- Jejeebhoy SH** (1998), Infertility in India-levels, Patterns and Consequences: Priorities for Social Science Research. *The Journal of Family Welfare* 44: 15-24.
- Jensen TK**, Bonde JP, Joffe M (2006), The influence of occupational exposure on male reproductive function. *Occup Med* 56: 544-553.
- Jiang W**, Guo MH, Hai X (2016), Hepatoprotective and antioxidant effects of lycopene on non-alcoholic fatty liver disease in rat. *World J Gastroenterol* 22: 10180-10188.
- Johnson BH**, Ewing LL (1971), Follicle-stimulating hormone and the regulation of testosterone secretion in rabbit testis. *Science* 17: 635-639.
- Johnston DS**, William W, Wright WW, Candeloro P, Wilson E, Kopf GS, Jelinsky SA. (2008), Stage-specific gene expression is a fundamental characteristic of rat spermatogenic cells and Sertoli cells. *Proc Natl Acad Sci* 105: 8315-8319.
- Joshi SG**, Gulati N, Gayraj A (2005), Evaluation of toxic injects of Mancozeb on testis in rats. *Asian J Exp Sc* 19: 73-78.
- Junge W**, Wilke B, Halabi A, Klein G (2004), Determination of reference intervals for serum creatinine, creatinine excretion and creatinine clearance with an enzymatic and a modified Jaffe method. *Clinica chimica acta* 344: 137-148.

-
- Jurasovic J**, Cvitkovic P, Pizent A, Colak B, Telisman S (2004), Semen quality and reproductive endocrine function with regard to blood cadmium in Croatian male subjects. *Biometals* 17: 735-743.
- Kabasakalian P**, Kalliney S, Westcott A (1973), Determination of uric acid in serum, with use of uricase and a tribromophenol aminoantipyrine chromogen. *Clin Chem* 19: 522-524.
- Kahn CR**, Smith RJ, Chin WW (1998), Mechanism of action of hormones that acts at the cell surface. In: Williams Text Books of Endocrinology. Wilson ZE, Foster DW, Kronenberg HM, Larsen PR (Eds). Philadelphia, W. B. Saunders Co, 1-95.
- Kalra EK** (2003), Nutraceutical-definition and introduction. *AAPS Pharm Sci* 5: 27-28.
- Kannan K**, Jain SK (2000), Oxidative stress and apoptosis. *Pathophysiol* 7: 153-163.
- Karthikeyan M**, Arunakaran J, Balasubramanian K. (2009), The effects of prolactin and corticosterone on insulin binding to rat Leydig cells. *Reprod Biol* 9: 189-196.
- Kasahara E**, Sato EF, Miyoshi M, Konaka R, Hiramoto K, Sasaki J (2002), Role of oxidative stress in germ cell apoptosis induced by di(2-ethylhexyl)phthalate. *Biochem J* 365: 849-856.
- Kemal DN**, Morshedi M, Oehninger S (2000), Effects of hydrogen peroxide on DNA and plasma membrane integrity of human spermatozoa. *Fertil Steril* 74: 1200-1207.
- Klebanov GI**, Kapitanov AB, Teselkin YU (1998), The antioxidant properties of Lycopene. *Membr Cell Biol* 12: 287-300.
- Kort HI**, Massey JB, Elsner CW, Mitchell-Leef D, Shapiro DB (2006), Impact of body mass index values on sperm quantity and quality. *J Androl* 27: 450-452.
- Kumar TCA** (2004), Fertility and *in-vitro* fertilization in India. *Curr Sci* 86: 254-256.
- Kunzle R**, Mueller MD, Hanggi W, Birkhauser MH, Drescher H (2003), Semen quality of male smokers and non-smokers in infertile couples. *Fertil Steril* 79: 287-291.
- Lampiao F** (2012), Free radicals generation in an *in vitro* fertilization setting and how to minimize them. *World J Obstet Gynecol* 1: 29-34.

-
- Lanzafame FM**, La Vignera S, Vicari E, Calogero AE (2009), Oxidative stress and medical antioxidant treatment in male infertility. *Reprod Biomed Online* 19: 638-659.
- Larsen U** (2000), Primary and Secondary Infertility in Sub-Saharan Africa. *Int J Epidemiol* 29: 285-291.
- Lavranos G**, Balla M, Tzortzopoulou A, Syriou V, Angelopoulou R (2012), Investigating ROS sources in male infertility: a common end for numerous pathways. *Reprod Toxicol* 34: 298-307.
- Law GDC**, Macle hose RF, Longnecker MP (2007), Obesity and time to pregnancy. *Hum Reprod* 22: 414-420.
- Leblond CP**, Clermont T (1952), Definition of the stages of the cycle of the seminiferous epithelium in the rat. *Annals of the New York Academy of Sciences* 55: 548-573.
- Leblond CP**, Steinberger E, Roosen-Runge EC (1963), Spermatogenesis. In: Mechanism concerned with conception. Hartman CH (Ed). New York, Pergamon Press, 1-3.
- Liu CY**, Chou YC, Lin SH, Wu ST, Cha TL, Chen H, Tsao CW (2017), Serum lipid profiles are associated with semen quality. *Asian J Androl* 19: 633-638.
- Lu JC**, Chen F, Xu HR, Huang YF, Lu NQ (2007), Standardization and quality control for determination of fructose in seminal plasma. *J Androl* 28: 207-213.
- Lu JC**, Huang YF, Lu NQ (2010), WHO Laboratory Manual for the Examination and Processing of Human Semen: its applicability to andrology laboratories in China. *Zhonghua Nan Ke Xue* 16: 867-871.
- Mahat RK**, Arora M, Bhale DV, Holkar S, Yadav T (2016), Risk Factors and Causes of Male Infertility-A Review. *Biochem B Anal Biochem* 5-1.
- Maheshwari A**, Misro MM, Aggarwal A (2009), Pathways involved in testicular germ cell apoptosis induced by H₂O₂ in vitro. *Fed Eur Biochem Soc* 276: 870-881.

-
- Mahmoud AM**, Goemaere S, El-Garem Y, Van Pottelbergh I, Comhaire FH (2003), Testicular volume in relation to hormonal indices of gonadal function in community-dwelling elderly men. *J Clin Endocrinol Metab* 88: 179-184.
- Makker K**, Agarwal A, Sharma R (2009), Oxidative stress & male infertility. *Indian J Med Res* 129: 357-367.
- Mallick C**, Bera TK, Ali KM, Chatterjee K, Ghosh D (2010), Diabetes-induced testicular disorders vis-a-vis germ cell apoptosis in albino rat: remedial effect of hexane fraction of root of *Musa paradisiaca* and leaf of *Coccinia indica*. *J Health Sci* 56: 641-654.
- Marcondes FK**, Bianchi FJ, Tanno AP (2002), Determination of the estrous cycle phases of rats: some helpful considerations. *Braz J Biol* 62: 609-614.
- Marklund S**, Marklund G (1974), Involvement of superoxide anion in auto oxidation of pyrogallol and a convenient assay of superoxide dismutase. *Eur J Biochem* 47: 469-474.
- Mascio DP**, Kaiser S, Sies H (1989), Lycopene as the most efficient biological carotenoid singlet oxygen quencher. *Arch Biochem Biophys* 274: 532-538.
- Mathew G**, Vander H, Thompson CB (1999), Bcl-2 proteins: regulators of apoptosis or of mitochondrial homeostasis. *Nat Cell Biol* 1: 209-216.
- Mattei R**, Stamammi A, Zucco F (1985), Acid phosphatase as a marker of cellular damage. characterization of two cell lines for toxicity studies. *Ann Ist super sanita* 21: 77-82.
- McCarty MF** (2013), Nutraceutical strategies for ameliorating the toxic effects of alcohol. *Med Hypotheses* 80: 456-462.
- McLachlan RI**, O'Donnell L, Stanton PG, Balourdos G, Frydenberg DE, Kretser DM, **Robertson DM** (2002), Identification of specific site of hormonal regulation in spermatogenesis in rats, monkeys and man. *Recent Prog Horm Res* 57: 149-153.
- Meena R**, Misro MM, Ghosh D, Nandan D (2012), Complete sperm suppression induced by dienogest plus testosterone undecanoate is associated with down-regulation in the expression of upstream steroidogenic enzyme genes in rat testis. *Contraception* 31: 163-171.

-
- Mein JR**, Lian F, Wang XD (2008), Biological activity of lycopene metabolites: implications for cancer prevention. *Nutr Rev* 66: 667-683.
- Mendola R**, Tennen H, Affleck G, McCann L, Fitzgerald T (1990). Appraisal and adaptation among women with impaired fertility. *Cognit Ther Res* 14: 79-93.
- Meriggiola MC**, Bremner WJ, Costantino A, Di Cintio G, Flamigni C (1998), Low dose of cyproterone acetate and testosterone enanthate for contraception in men. *Hum Reprod* 13: 1225-1229.
- Migally N** (2009), The effect of cyproterone acetate on the mouse adenohipophysis. II. gonadotrophs and somatotrophs. *Arch Androl* 6: 127-132.
- Miller NJ**, Sampson J, Candeias LP, Bramley PM, Rice-Evans CA (1996), Antioxidant activities of carotenes and xanthophylls. *FEBS Lett* 384: 240-242.
- Miller WL**, Auchus RJ (2011), The molecular biology, biochemistry, and physiology of human steroidogenesis and its disorders. *Endocr Rev* 32: 81-151.
- Miranda-Vilela AL**, Alves PC, Akimoto AK, Pereira LC, Nazare Klautau-Guimaraes M, Grisolia CK (2010), The effect of hydrogen peroxide-induced oxidative stress on leukocytes depends on age and physical training in healthy human subjects carrying the same genotypes of antioxidant enzymes' gene polymorphisms. *Am J Hum Biol* 22: 807-812.
- Mishra RK**, Verma HP, Singh N, Singh SK (2012), Male infertility: lifestyle and oriental remedies. *J Sci Res* 56: 93-101.
- Miyamoto T**, Tsujimura A, Miyagawa Y, Koh E, Namiki M, Sengoku K (2012). Male Infertility and Its Causes in Human. *Adv Urol* 2012: 1-7
- Moghissi KS**, Wallach EE (1983). Unexplained infertility. *Fertil Steril* 39: 5-21.
- Moltz L**, Rommler A, Post K, Schwartz U (1980), Medium dose cyproterone acetate (CPA): effects on hormone secretion and on spermatogenesis in men. *Contraception*, 21: 393-413.
- Moon JY**, Choi MH, Kim J (2016), Metabolic profiling of cholesterol and sex steroid hormones to monitor urological diseases. *Endocr Relat Cancer* 23: 455-467.

-
- Mora-Esteves C**, Shin D (2013), Nutrient supplementation: improving male fertility fourfold. *Semin Reprod Med* 1: 293-300.
- Morohashi K**, Baba T, Tanaka M (2013), Steroid hormones and the development of reproductive organs. *Sex Dev* 7: 61-79.
- Mukai C**, Travis AJ (2012), What sperm can teach us about energy production. *Reprod Domest Anim* 47: 164-169.
- Multigner L**, Ben BE, Arnaud I, Haguenoer JM, Jouannet P (2007), Glycol ethers and semen quality: a cross-sectional study among male workers in the Paris Municipality. *Occup Environ Med* 64: 467-473
- Murono EP**, Payne AH (1979), Testicular maturation in the rat. In vivo effects of gonadotrophins and steroidogenic enzymes in hypophysectomy immature rat. *Biol Reprod* 20: 911-914.
- Nadeem F**, Fahim A, Bugti S (2012), Effects of cigarette smoking on male infertility. *Turk J Med Sci* 42: 1400-1405.
- Nguyen RH**, Wilcox AJ, Skjaerven R, Baird DD (2007), Men's body mass index and infertility. *Hum Reprod* 22: 2488-2493.
- Nieschlag E** (2000). Classification of andrological disorders. In: Andrology: male reproductive health and dysfunction. Nieschlag E and Behre HM (Eds). Berlin, Springer.
- Novak CM**, Parfitt DV, Cheryl L, Sisk CL, Smale L (2007), Associations between behavior, hormones, and Fos responses to novelty differ in pre-and post-pubertal grass rats. *Physiol Behav* 90: 125-129.
- Ohkawa H**, Ohishi N, Yagi K (1979), Assay for lipid peroxidation in animal tissues by thiobarbituric acid reaction. *Anal biochem* 95: 351-358.
- Okanlawon AO**, Kusemiju O, Dym M (2001), Direct toxic effects of clinical doses of chloroquine on transferring secretion in immature rat sertoli-cell in vitro. *Nige Postgrad Med J* 8: 165-169.

-
- Olayemi FO** (2010), A review on some causes of male infertility. *Afr J Biotechnol* 9: 2834-2842.
- Palan P**, Naz R (1996), Changes in various antioxidant levels in human seminal plasma related to immunoinfertility. *Arch Androl* 36: 139-143.
- Pant N**, Srivastava SP (2003), Testicular and spermatotoxic effect of quinaphos in rats. *J Appl Toxicol* 23: 271-274.
- Pasha H** (2011), Evaluation of depression in infertile women using Beck and Hamilton. *Int J Fertil Steril* 5: 99.
- Pasqualotto FF**, Borges JE, Pasqualotto EB (2008), He male biological clock is ticking: a review of the literature. *Sao Paulo Med J* 126: 197-201.
- Pasqualotto FF**, Lucon AM, Hallak J, Pasqualotto EB (2004), Risks and benefits of hormone replacement therapy in older men. *Rev Hosp Clin Fac Med Sao Paulo* 59: 32-38.
- Paul D**, Mallick C, Ali KM, Nandi DK, Ghosh D (2010), Duration dependent effect of hydro-ethanolic extract of leaf of *S. hernandifolia* and root of *A. aspera* on testicular androgenic and gametogenic activity: An approach for male herbal contraceptive development. *Int J Appl Res Nat Produc* 2: 1-12.
- Pautanen M**, Isomaa V, Peltoketo H, Vilko R (1995), Regulation of estrogen action: role of 17β Hydroxy steroid dehydrogenases. *Animal Med* 27: 675-681.
- Pitteloud N**, Thambundit A, Dwyer A, Falardeau JL, Plummer L, Caronia LM, Frances J, Hayes FJ, Lee H, Boepple P, Crowley WF (2009), Role of seminiferous tubular development in determining the FSH versus LH responsiveness to GnRH in early sexual maturation. *J Neuroendocrinol* 90: 260-263.
- Plant TM**, Marshall GR (2001), The functional significance of FSH in the spermatogenesis is the control of its secretion in male primates. *Endocrinol Rev* 22: 764-767.
- Plummer DT** (1995), An introduction to practical biochemistry. Tata Mc Graw- Hill Publishing Company Ltd. New Delhi, 3rd ed: 189.

-
- Preethi KC**, Kuttan R (2009), Hepato and reno protective action of *Calendula officinalis* L. flower extract. *Indian J Exp Biol* 47: 163-168.
- Queiroz EK**, Waissmann W (2006), Occupational exposure and effects on the male reproductive system. *Cad Saude Publica* 22: 485-493.
- Quinn PG**, Payne AH (1985), Steroid product induced, oxygen mediated damage of microsomal cytochrome P450 enzymes in Leydig cell culture. *J Biol Chem* 260: 2692-2697.
- Raj MV**, Selvakumar K, Krishnamoorthy G, Revathy S, Elumalai P, Arunakaran J (2014), Impact of lycopene on epididymal androgen and estrogen receptors' expression in polychlorinated bisphenyls-exposed rat. *Reprod Sci*, 21: 89-101.
- Ramaswamy S**, Plant TM (2001), Operation of the follicle-stimulating hormone (FSH)-inhibin B feedback loop in the control of primate spermatogenesis. *Mol Cell Endocrinol* 180: 193-199.
- Recknagel RO**, Glende EA, Dolak JA, Waller RL (1989), Mechanisms of carbon tetrachloride toxicity. *Pharmacol Ther* 43:139-154.
- Reinhold J** (1980), Determination of serum total protein, albumin and globulin fractions by the biuret method. *Clin Biochem* 1: 545-547.
- Rengan AK**, Agarwal A, Van der Linde M, Du Plessis SS (2012), An investigation of excess residual cytoplasm in human spermatozoa and its distinction from the cytoplasmic droplet. *Reprod Biol Endocrinol* 10: 92-93.
- Robberecht W**, Denef C (1988), Stimulation and inhibition of pituitary growth hormone release by angiotensin II in vitro. *Endocrinology* 122: 1496-1504.
- Rodkey FL** (1965), Direct spectrophotometric determination of albumin and globulin in human serum. *Clin Chem* 11: 478-487.
- Rodriguez H**, Ohanian C, Bustos-obregon E (1985), Nuclear chromatin decondensation of spermatozoa in vitro: a method for evaluating the fertilizing ability of ovine semen. *Int J Androl* 8: 147-158.

-
- Romero FJ**, Bosch MF, Romero MJ, Jareno EJ, Romero B, Marin N, Roma J (1998), Lipid peroxidation products and antioxidants in human disease. *Environ. Health. Perspect* 5: 106-110.
- Rossen-Runge EC**, Gisel LO (1950), Quarnative studies on spermatogenesis in the albino rat. *Am J Anat* 87: 1-7.
- Rutstein SO**, Iqbal HS (2004), Infecundity, Infertility and Childlessness in Developing Countries. DHS Comparative Reports No. 9. Calverton, Maryland, uSA: ORC Macro and the World Health Organization.
- Saalu LC** (2010), The incriminating role of reactive oxygen species in idiopathic male infertility: an evidence based evaluation. *Pak J Biol Sci* 13: 413-422.
- Sabeur K**, Ball BA (2007), Characterization of NADPH oxidase 5 in equine testis and spermatozoa. *Reproduction* 134: 263-270.
- Sadasivam S**, Manickam A (2008), Biochemical methods. New age International Pvt. Ltd., New Delhi, 3rd ed: 100-101.
- Sadasivam S**, Manickam A (2008), Carbohydrate. In: Biochemical Methods. Sadavidam S and Manickam A (Eds). New Age International Pvt. Ltd, New Delhi, 11-12.
- Saidapur SK**, Yajurvedi HN, Hooli MA (1981), The effect of cyproterone acetate on spermatogenesis and thumb pads of the skipper frog, *Rana cyanophlyctis* (Schn.). *Experientia* 37: 1162-1163.
- Saito K**, Donnell L, Robert I, McLachlan D, Robertson M (2000), Spermiation failure is a major contributor to early spermatogenic suppression caused by hormone withdrawal in adult rats. *Endocrinol* 141: 2779-2783.
- Salas-Huetos A**, Bullo M, Salas-Salvado J (2017), Dietary patterns, foods and nutrients in male fertility parameters and fecundability: a systematic review of observational studies. *Hum Reprod Update* 23: 371-389.

- Saleh RA**, Agarwal A, Nada EA, El-Tonsy MH, Sharma RK, Meyer A (2003), Negative effects of increased sperm DNA damage in relation to seminal oxidative stress in men with idiopathic and male factor infertility. *Fertil Steril* 3: 1597-1605.
- Sallmen M**, Sandler DP, Hoppin JA, Blair A, Baird DD (2006), Reduced fertility among overweight and obese men. *Epidemiol* 17: 520-523.
- Salman A**, Eve R (2007), Regulation of Leydig cell cholesterol catabolism. *Contempt Endocrinol* 3: 135-141.
- Sanocka D**, Kurpisz M (2004), Reactive oxygen species and sperm cells. *Reprod Biol Endocrinol* 2: 12-14.
- Savidou I**, Deutsch M, Soutati AS, Koudouras D, Kafiri G, Dourakis SP (2006), Hepatotoxicity induced by cyproterone acetate: A report of three cases. *World J Gastroenterol* 12: 7551-7555.
- Schulte RT**, Ohl DA, Sigman M, Smith GD (2010), Sperm DNA damage in male infertility: etiologies, assays, and outcomes. *J Assist Reprod Genet* 27: 3-12.
- Sharma RK**, Agarwal A (1996), Role of reactive oxygen species in male infertility. *Urology* 48: 835-850.
- Sheynkin Y**, Jung M, Yoo P, Schulsinger D, Komaroff E (2005), Increase in scrotal temperature in laptop computer users. *Hum Reprod* 20: 452-455.
- Shikone T**, Billi H, Hsueh AJ (1994), Experimentally induced cryptorchidism increases apoptosis in rat testis. *Biol Reprod* 51: 865-872.
- Shiraishi K**, Matsuyama H, Takihara H (2012), Pathophysiology of varicocele in male infertility in the era of assisted reproductive technology. *Int J Urol* 19: 538-550.
- Shivaraya M**, Halemani B (2007), Infertility: Psycho-Social Consequence of Infertility on Women in India. *Indian J Social Dev* 7: 309-316

- Sigman M**, Lipshultz L, Howard S (2009). Office evaluation of the subfertile male. In: Infertility in the male. Lipshultz LI, Howards SS, Niederberge CS (Eds). Cambridge University Press, UK, 153–176.
- Sikka SC** (2001), Relative impact of oxidative stress on male reproductive function. *Curr Med Chem* 8: 851-862.
- Simard J**, Ricketts ML, Gingras S, Soucy PF, Feltus A, Michael HM (2005), Molecular biology of the 3 β -Hydroxysteroid dehydrogenase/ Δ 5- Δ 4 isomerase gene family. *Endocrine Rev* 26: 525-529.
- Singh NP**, McCoy MT, Tice RR, Schneider EL (1988), A simple technique for quantitation of low levels of DNA damage in individual cells. *Exp Cell Res* 175: 184-191.
- Slater TF** (1984), Overview of methods used for detecting lipid peroxidation. *Methods Enzymol* 105: 283-293.
- Sokal RR**, Rohle FJ (1997), Introduction to analysis of variance. In: Biometry. Sokal RR and Rohle FJ (Eds). WH Freeman and Company, New York, 179-206.
- Sriastava TG** (2001), Enzyme linked immunosorbent assay for steroid hormone. In: Orientation Training Course on Research Methodology in Reproductive Medicine. Misro MM and Srivastava TG (Eds). Laboratory Manual, Department Reproductive Medicine, National Institute of Health and Family Welfare, Govt. of India, New Delhi, 55-58.
- Srinivasan M**, Sudheer AR, Pillai KR, Kumar PR, Sudhakaran PR, Menon VP (2007), Lycopene as a natural protector against gamma-radiation induced DNA damage, lipid peroxidation and antioxidant status in primary culture of isolated rat hepatocytes in vitro. *Biochim Biophys Acta* 177: 659–665
- Stabler T**, Kenjale A, Ham K, Jelesoff N, Allen J (2010), Potential mechanisms for reduced delivery of nitric oxide to peripheral tissues in diabetes mellitus. *Ann. New York Acad. Sci.* 1203:101-106.

- Stanczik FZ** (1997), Steroid hormone In: Infertility, contraception, and reproductive endocrinology. Rojerio AL, Daniel RM, Richard JP, Donna S (Eds). Massachusetts, Blackwell science, 35-46.
- Steinberger EA** (1962), Quantitative of the effect of an alkylating agent (triethylenelamine) on the seminiferous epithelium on the rat. *J Reprod Fertil* 3: 250-253.
- Syed GH** (2007), Leydig Cell steroidogenesis: Unmasking the functional importance of mitochondria. *Endocrinol* 148: 2581-2586.
- Talalay P** (1962), Hydroxysteroid dehydrogenase. In: Methods in Enzymology. Colowick SP and Kalpana NO (Eds). Academic Press, New York, 512-516.
- Talwar PP, Go OP, Murali IN** (1986), New Delhi: National Institute of Health and Family Welfare and Indian Council of Medical Research; Prevalence of infertility in different population groups in India and its determinants.
- Tam NN, Gao Y, Ho SM** (2003), Androgenic regulation of oxidative stress in the rat prostate involvement of NAD(P)H oxidases and antioxidant defence machinery during prostatic evolution and regrowth. *Am J Pathol* 163: 2513-2522.
- Tan BL, Norhaizan ME, Liew WP and Pahman HS** (2018), Antioxidant and oxidative stress: A mutual interplay in age-related disease. *Front Pharmacol* 9: 1-28.
- Ten J, Mendiola J, Torres-Cantero AM, Moreno-Grau JM, Moreno-Grau S** (2008), Occupational and lifestyle exposures on male infertility: A mini review. *Open Reprod Sci J* 1: 16-21
- Tiffany TO, Jansen JM, Burtis CA, Overton JB, Scott CD** (1972), Enzymatic kinetic rate and end point analyses of substrate, by use of a GeMSAEC fast analyzer. *Clin Chem* 18: 829-840.
- Toren D, Menon KMJ, Farchielli E, Dorfman RI** (1962). In vitro enzymatic cleavage of the cholesterol side chain in rat testis preparations. *Steroids* 3: 301-307.

- Toshmori K** (2003), Biology of spermatozoa maturation: an over view with introduction to this tissue. *Micros Res Tech* 61: 1-8.
- Tremellen K** (2008), Oxidative stress and male infertility--a clinical perspective. *Hum Reprod Update* 14: 243-258.
- Tripathi UK**, Chhillar S, Kumaresan A, Muhammad Aslam K (2015), Morphometric evaluation of seminiferous tubule and proportionate numerical analysis of Sertoli and spermatogenic cells indicate differences between crossbred and purebred bulls. *Vet World* 8: 645-650.
- Tripathy A**, Ghosh A, Dey A, Pakhira BP, Ghosh D (2016), Attenuation of the cyproterone acetate-induced testicular hypofunction by a novel nutraceutical lycopene: a genomic approach. *Andrologia* 49: 1-11.
- Trussell JC** (2013), Optimal diagnosis and medical treatment of male infertility. *Semin Reprod Med* 31: 235-236.
- Tsang BK**, Kinson GA (1980), In: Clinical in Andrology. Cunningham GR, Schell WB, Hafez RS (Eds). Hague, Martinus-Nizhoff, 1-109.
- Udoh PB**, Udoh FV, Umoren EB, James UW, Okeke CP, Agwu B (2009), Effect of caricapryl-99 seed alkaloid extract on the serum levels of sex hormones and pituitary gonadotrophins in male albino rats. *Nigerian J Phy Sci* 24: 13-18.
- Unisa S** (1999), Childlessness in Andhra Pradesh, India: Treatment seeking and Consequences. *Reprod Health Matters* 7: 54-65.
- Vanha-perttula T**, Nikkanen V (1973), Acid phosphatase of the rat testis in experimental condition. *Acta Endocrinol* 72: 376-390.
- Vereckei A**, Blazovics A, Gyorgy I, Feher E, Toth M, Szenasi G, Zsinka A, Foldiak G, Feher J (1993), The role of free radicals in the pathogenesis of amiodarone toxicity. *J Cardiovasc Electrophysiol* 4: 161-177.

- Vidal S**, Roman A, Moya L, Kovacs K (2000), Expression of 3-hydroxysteroid dehydrogenase/isomerase in the female rat pituitary. *J Endocrinol* 166: 95-99.
- Waenic RG**, Albers JJ (1978), A comprehensive evaluation of the heparin manganese precipitation procedure for estimating high density lipoprotein cholesterol. *J Lipid Res* 19: 65-76.
- Wagner H**, Cheng JW, Ko EY (2018), Role of reactive oxygen species in male infertility: An updated review of literature. *Arab J Urol* 16: 35-43
- Wang C**, Youle RJ (2009), The role of mitochondria in apoptosis. *Annu Rev Genet* 43: 95-118.
- Wdowiak A**, Wdowiak L, Wiktor H (2007), Evaluation of the effect of using mobile phones on male fertility. *Ann Agric Environ Med* 14: 169-172.
- WHO** (1999), Laboratory manual for the examination of human semen and sperm-cervical mucus interaction, 4th edn. Cambridge University Press, New York, 68-70.
- Will MA**, Swain J, Fode M, Sonksen J, Christman GM, Ohl D (2011), The great debate: varicocele treatment and impact on fertility. *Fertil Steril* 95: 841-852.
- Winters SJ**, Takahashi J, Troen P (1999), Secretion of testosterone and its delta 4 precursor steroids into spermatic vein blood in men with varicocele associated infertility. *J Clin Endocrinol Metab* 84: 997-1003.
- Woollorton E** (2003), Diane-35 (cyproterone acetate): safety concerns. *Can Med Assoc J* 168: 455-456.
- World Health Organization** (1987), Towards more objectivity in diagnosis and management of male infertility. *Int J Androl* 7: 1-53.
- World Health Organization** (WHO) (1991), Infertility: A Tabulation of Available Data on Prevalence of Primary and Secondary Infertility. WHO/MCH/91.9 World Health Organization, Geneva.

- Xin Z**, Qi W, Neil B, Xiao C (2010), Effect of lycopene on androgen receptor and prostate-specific antigen velocity. *Chin Med J* 123: 2231-2236.
- Yadav R**, Mehta SN, Kumar A, Guleria S, Sennu V, Tiwari SC (2008), A prospective analysis of testicular androgenic function in recipients of a renal allograft. *Int Urol Nephrol* 40: 397-403.
- Yama OE**, Osinubi AA, Duru FI, Noronha CC, Okanlawon AO (2011). Contraceptive effect of methanolic extract of *Momordica charantia* seed in male Sprague-Dawley rats. *Asian J Pharm Clin Res* 4: 22-26.
- Zargar AH**, Wani AI, Masoodi SR, Laway BA, Salahuddin M (1997), Epidemiologic and etiologic aspects of primary infertility in the Kashmir region of India. *Fertil Steril* 68: 637-643.
- Zegers-Hochschild F**, Adamson GD, De Mouzon J, Ishihara O, Mansour R (2009). International committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) revised glossary of ART terminology. *Fertil Steril* 92: 1520-1524.
- Zemjanis R** (1977), Diagnostic and therapeutic technique in animal reproduction. Williams and Wikins Company, Baltimore, 88-96.
- Zribi N**, Chakroun NF, Elleuch H, Abdallah FB, Ben Hamida AS, Gargouri J (2011), Sperm DNA fragmentation and oxidation are independent of malondialdehyde. *Reprod Biol Endocrinol* 9: 47-52.
- Zubeldia-Brenner L**, Roselli CE, Recabarren SE, Gonzalez Deniselle M C, Lara H E (2017), Developmental and functional effects of steroid hormones on the neuroendocrine axis and spinal cord. *J Neuroendocrinol* 28: 1-28.