

Comparison and Analytical Impact of Various Methods of Contraception on Liver Profile of Females of Sindh Province

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ABSTRACT

Objective: To Compare and Analyze the impact of different methods of contraception on liver Profile of females of Sindh province.

Study setting: This is a comparative cross-sectional study that was done at Liaquat university of medical and health sciences Jamshoro, at center 'A' of reproductive health services.

Methodology: 300 participants from Hyderabad Sindh were selected. Females aged 20 to 40 years and those on an individual method of contraception were selected. 300 females were selected for this study. Among them, 138 (46.0%) were residents of rural Sindh whereas 162 (54.0%) belonged to urban Sindh. Consent from participants both verbal and written was taken. A structured questionnaire was filled out for demographic characteristics following detailed history. Blood Sampling was done for liver function test.

Results: The results showed that present users of contraceptives generally had significantly greater liver parameters bilirubin, gamma GT, SGPT, and Alkaline phosphates compared to non-users (p-value = <0.05). Bilirubin level was considerably greater among women who were using the contraceptive methods DMPA injection (0.72±0.24), Jadelle (0.54±0.26), IUCD (0.44±0.18) than the corresponding values for nonusers (0.43±0.194) [control 0.43±0.194 vs DMPA injection (0.72±0.24) vs Jadelle (0.54±0.26) vs IUCD (0.44±0.18), P-value = <0.05]. Gamma GT level was considerably greater among women who were using the contraceptive methods Jadelle (20.36±11.97), Oral (14.00±3.2) than the corresponding values for non users (15.42±7.36) [control 15.42±7.36 Jadelle (20.36±11.97) vs Oral (14.00±3.2) P-value = <0.05]. SGPT level was considerably greater among women who were using the contraceptive methods DMPA injection (32.68±18.37), Jadelle (31.34±14.13), IUCD (29.66±14.62), Tubal ligation (18.00±0.00) than the corresponding values for nonusers (25.39±14.59) [control 25.39±14.59 vs injection (32.68±18.37) vs Jadelle (31.34±14.13) vs IUCD (29.66±14.62), Tubal ligation (18.00±0.00) P-value = < 0.05]. Alkaline Phosphatase level was considerably greater among women who were using the contraceptive methods DMPA injection (114.65±48.19), Jadelle (99.28±38.076), IUCD (101.74±42.23), Oral (78.89±21.70), Tubal Ligation (62.50±2.12), Condom (94.62±25.67) than the corresponding values for nonusers (131.51±59.04) [control 131.51±59.04 vs DMPA injection (114.65±48.19) vs Jadelle (99.28±38.076) vs IUCD (101.74±42.23), Oral (78.89±21.70), Tubal ligation (62.50±2.12), Condom (94.62±25.67) P-value = < 0.05].

Conclusion: The impact on the liver of different contraceptive methods was compared and analyzed in the population of Sindh.

Keywords: DMPA (depot- medroxy progesterone acetate), Implant, Oral Pills, IUCD (intrauterine contraceptive device), tubal ligation.

INTRODUCTION

Globally, out of 1.9 billion females of reproductive age, 1.1 billion require family scheduling; contraceptive methods are used by 840 million nevertheless universally 270 million require contraception [1]. 218 million women are contemplated to have an unmet desire for planned family planning (FP), and around half (49 percent) of conceptions are unplanned [2], in low- and middle-income nations (LMICS). Pakistan stands as the fifth most populated country, with an escalated total fertility rate (i.e. 3.6 childbirths per woman) [3]. From the current 208 to 310 million its population will rise by 2050 as can be foreseen by its existing growth rate of population (2.4 %) [4]. This will have an intense impact on socio-economic standing and Pakistan's environment and will influence its reliability to accomplish its Sustainable Development Goals, specifically SDG-3 (Good health and well-being) [5]. Pakistan's demographic requirements are clearly out of balance now [6]. Maternal health is damaged by short gaps in planning as a family [7]. Intrauterine Contraceptive devices (IUCD), DMPA, and Implants are included in Long-acting reversible contraceptives (LARCs), which are much capable means of brief contraception for an extended period, that does not need user act. [8,9].

There fore the objective of the study is to figure out and compare the impact of different contraceptive method on liver function test so residents of Hyderabad Sindh.

METHODS

This is a comparative cross-sectional study that was done at Liaquat University of medical sciences Jamshoro center 'A' of Reproductive Health Services. The study period is 2 years (roughly) after synopsis approval. Rao software is used to calculate the

Sample size $n=300$. Non-Probability purposive sampling is the sampling technique. Females between 20 to 40 yrs, Applicants from the Province of Sindh, and Females using an individual mode of contraception were selected. Where as females reluctant to participate, Ladies suffering from any illness, and Females on medications. Women below 20 yrs and above 40 yrs, expecting women, menopausal women, Single Females, and females using several methods of contraception were omitted. From contributing, individuals on paper and vocal consent were taken. For finding data related to socio-demographic structures, an organized questionnaire was used. Self-structured Questionnaire was used for data collection and detailed history was taken.

Statistical Methods: Version 22 of SPSS was used for the analysis of sample data. Shapiro-Wilk test was used for the normality of data. The chi-square test calculated percentages for qualitative variables. the p-value of < 0.05 was considered significant.

RESULTS

300 participants who fulfilled the inclusion criteria were registered, aged between 20 years to 40 years, the majority of participants belonged to the age group more than 30 years $n=155$ (51.70%), participants between 21 to 30 years were $n=132$ (44.0%), and participants aged less than 20 years were $n=13$ (4.3%). The results of this study showed that the current users of contraceptive methods generally had considerably greater Hepatic Parameters, Bilirubin, Gamma GT, SGPT, and Alk Phosp levels than the non-users (P-value = <0.05). Bilirubin level was considerably greater among women who were using the contraceptive methods injection (0.72±0.24), Jadelle (0.54±0.26), IUCD (0.44±0.18) than

the corresponding values for nonusers(0.43±0.194)[control0.43±0.194 injection(0.72±0.24)vsJadelle(0.54±0.26)vsIUCD (0.44±0.18), P-value=<0.05)]. Table1

Gamma GT level was considerably greater among women who were using the contraceptive methods Jadelle(20.36±11.97), andOral(14.00±3.2) than the corresponding values fornonusers(15.42±7.36)[control15.42±7.36Jadelle(20.36±11.97)vs Oral(14.00±3.2)Oral(14.00±3.2)P-value=<0.05)]. Table2

SGPT level was considerably greater among women who were using the contraceptive methods injection (32.68±18.37), Jadelle (31.34±14.13), IUCD (29.66±14.62), Tubal ligation(18.00±0.00) than the corresponding values for

nonusers(25.39±14.59)[control25.39±14.59vsinjection (32.68±18.37) vs Jadelle (31.34±14.13) vs IUCD (29.66±14.62), Tubal ligation(18.00±0.00)P-value=<0.05)]. Table 3

Alkaline Phosphatase level was considerably greater among women who were using thecontraceptivemethodsinjection(114.65±48.19),Jadelle(99.28±38.076),IUCD(101.74±42.23),Oral (78.89±21.70), Tubal Ligation (62.50±2.12) Condom (94.62±25.67) than the corresponding valuesfornonusers(131.51±59.04)[control131.51±59.04vsinjection(114.65±48.19)vsJadelle (99.28±38.076)vsIUCD (101.74±42.23),Oral(78.89±21.70)Tubal ligation(62.50±2.12)Condom(94.62±25.67)P-value=< 0.05)]. Table4

Table 1: Showing Bilirubin level of non-users and users of different contraceptive methods users:

Groups of Methods of Family Planning									Significance
Variable	Group A (Control) n=104	Group B (injection) n= 54	Group C (Jadelle) n= 92	Group D (IUCD) n= 31	Group E (Oral) n= 9	Group F (Tubal ligation) n= 2	Group G (Condom) n=8	Multiple comparison between the groups	p-value
Bilirubin	0.43±0.19	0.72±0.24	0.54±0.26	0.44±0.18	0.46±0.21	0.54±0.21	0.57±0.29	A vs B	<0.0001
	0.43 ±0.19	0.72±0.24	0.54±0.26	0.44±0.18	0.46±0.21	0.54±0.21	0.57±0.29	B vs C	0.023
	0.43 ±0.19	0.72±0.24	0.54±0.26	0.44±0.18	0.46±0.21	0.54±0.21	0.57±0.29	A vs C	0.0001
	0.43 ±0.19	0.72±0.24	0.54±0.26	0.44±0.18	0.46±0.21	0.54±0.21	0.57±0.29	C vs D	0.0001
	0.43 ±0.19	0.72±0.24	0.54±0.26	0.44±0.18	0.46±0.21	0.54±0.21	0.57±0.29	D vs B	<0.0001

Table 2: Showing Gamma GT level(IU/L) of non-users and users of different contraceptive methods

Groups of Methods of Family Planning									Significance
Variable	Group A (Control) n=104	Group B (injection) n= 54	Group C (Jadelle) n= 92	Group D (IUCD) n= 31	Group E (Oral) n= 9	Group F (Tubal ligation) n= 2	Group G (Condom) n=	Multiple comparison between the groups	p-value
Gamma GT	15.42±7.36	19.93±16.31	20.36±11.97	17.55±11.69	14.00±3.2	16.50±9.19	14.75±5.14	A vs C	0.028
	15.42±7.36	19.93±16.31	20.36±11.97	17.55±11.69	14.00±3.2	16.50±9.19	14.75±5.14	A vs E	0.016
	15.42±7.36	19.93±16.31	20.36±11.97	17.55±11.69	14.00±3.2	16.50±9.19	14.75±5.14	E vs C	0.016

Table 3: Showing SGPT level(IU/L) of non-users and user so different contraceptive methods users:

Groups of Methods of Family Planning									Significance
Variable	Group A (Control) n=104	Group B (injection) n= 54	Group C (Jadelle) n= 92	Group D (IUCD) n= 31	Group E (Oral) n= 9	Group F (Tubal ligation) n= 2	Group G (Condom) n=	Multiple comparison between the groups	p-value
SGPT	25.39±14.59	32.68±18.37	31.34±14.13	29.66±14.62	25.74±8.63	18.00±0.00	27.00±9.79	A vs F	<0.0001
	25.39±14.59	32.68±18.37	31.34±14.13	29.66±14.62	25.74±8.63	18.00±0.00	27.00±9.79	B vs F	<0.0001
	25.39±14.59	32.68±18.37	31.34±14.13	29.66±14.62	25.74±8.63	18.00±0.00	27.00±9.79	D vs F	0.0002

Table 4: Showing Alkaline phosphatase level (IU/L) of non-users and users of different contraceptive methods users:

Groups of Methods of Family Planning									Significance
Variable	Group A (Control) n=104	Group B (injection) n= 54	Group C (Jadelle) n= 92	Group D (IUCD) n= 31	Group E (Oral) n= 9	Group F (Tubal ligation) n= 2	Group G (Condom) n=	Multiple comparison between the groups	p-value
Alkaline Phosphatase	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	A vs B	<0.0001
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	B vs C	0.027
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	C vs D	0.0001
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	D vs F	<0.0001
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	B vs F	<0.001
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	C vs A	<0.0001
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	A vs F	<0.001
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	D vs A	0.027
	131.51±59.04	114.65±48.19	99.28±38.076	101.74±42.23	78.89±21.70	62.50±2.12	94.62±25.67	E vs A	0.001

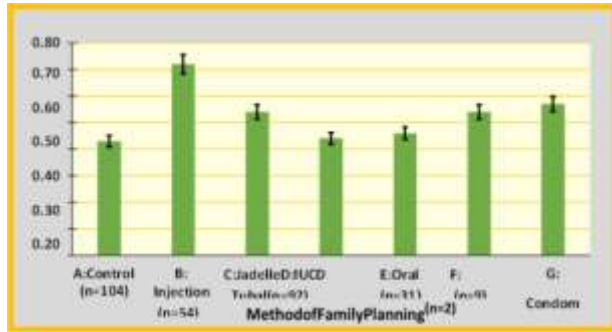


Figure 1: Showing Bilirubin level of non-users and users of different contraceptive methods users

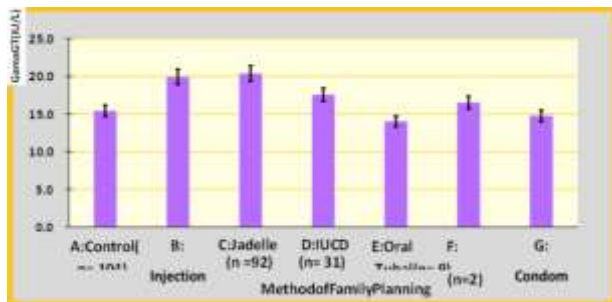


Figure 2: Showing Gamma GT level (IU/L) of non-users and users of different contraceptive methods users

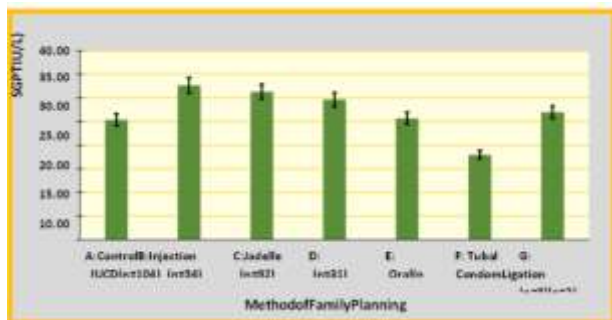


Figure 3: Showing SGPT level (IU/L) of non-users and users of different contraceptive methods user

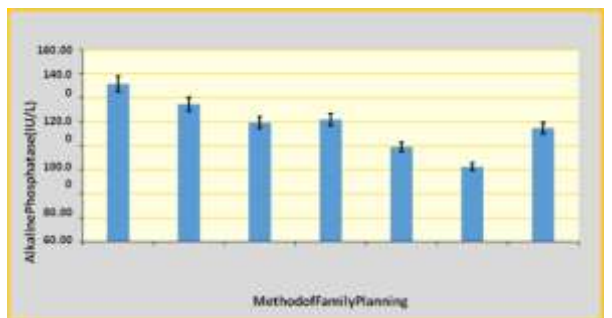


Figure 4: Showing Alkaline phosphatase level (IU/L) of non-users and users of different contraceptive methods users:

DISCUSSIONS

Short-duration as well as long-duration means of family scheduling improve the health of the mother by escaping unplanned gestations, to protect healthy scheduling and spacing of the birth of a child. In the metabolism of estrogens and progester ones central role is played by the liver. A diversity of biological effects that have

both physiological and pathological importance are produced by either direct or indirect action of COC on the liver (10). Prime indicators of liver damage are raised levels of hepatic enzymes in the blood. In users utilizing different methods of contraception, elevated level of ALP, AST, and SGPT (ALT) maybe due to functional changes comprising hepatic cex cretory mechanism. The finding of elevated enzy mesin the liver is in agreement with that of Dicker son et al.(11),ReichlingJ.,1988(12)and conflicts with that of Sura sak et al., 2007(13) who doesn't find any changes in hepatic enzy mes infema leson COC.It is also opposed to El-Allaw yetal.,1984(14),and El Gendy and Toha my

1998 (15) who found a decreased level of alkaline phosphatase. γ-glutamyl transferase brings oxidative stress in the wall of an artery in the free iron presence and GGT also likely is an im portant pointer of reduced glutathione supply, particularly in the liver, Koenig G.,2015 (16)that leads to a cluster of issues associated to elevated oxidative stress, consequently greater GG Tactivity in serum of OCs can point to greater warning for diseases development. Elevated concentrations (μ/l) of both ala nine transaminase (ALT) (SGPT) and as partate transaminase (AST) are induced by DMPA doses. Inevaluating liver functionand damage, trans aminases were considered to be a very sensitive measure (17). In the present work, the elevation of alanineam in otrans ferase is in agreement with Fakhry et al.,1988(18), who recognized this rise to hepatocellular injury brought by estrogen and progesterone. Further, modifications in the metabolism of carbohydrates and the function of the liver in prolonged users of DMPA were reported by Mukherjea et al.,1981(19). Malfunction of the liver after temporary usage of hormonal contraceptives was reported by Ikekpeazu et al. ,2009(20). Faddah et al., 2005 (21)specified that hepatic functions (AST, ALP, and Total Bilirubin) were considerably raised in the first year of the administration of DMPA. Alkaline phosphatase is related to membranes of cells, and raised evels may bep roduced by damage to the liver, kidneys, bones, placenta, intestines, orleukocytes.(22,23,24,25).

CONCLUSIONS

1. Hepatic impact of different contraceptives was compared and analyzed, which helps to find a contraceptive method that is safe and comparatively has fewer side effects.
2. Higher level of Bilirubin, SGPT, GGT, and alkaline phosphatase in the plasma of contraceptive users was found as compared to non-users hence confirming the hostile impacts of hormone alcontraption on the liver.
3. Bilirubin, SGPT, GGT, and Alka line phosphatase levels in contraceptive users must be observed annually.

Conflict of interest: The authors confirm that they do not have any contrasting interests.

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