

Beware of Hepatotoxic Oral Contraceptives-An Insilico Study



Priyanka Tiwari

Guest Faculty,
Deptt. of Zoology,
Govt. Autonomous Holkar Science
College, Indore

Abstract

Liver dysfunction associated with consumption of certain drugs refers to hepatotoxicity. Oral contraceptives are the drugs used to avoid pregnancy. These medicines are birth control pills. In the present study insilico methods were incorporated to prepare list of hepatotoxic oral contraceptives. In the present work data mining was extensively done using selected databases. Results provide a list of oral contraceptives known to cause hepatotoxicity. Present work aims to beware common people of society who consume medicines without expert advice and medical prescription unknowingly side effects of the overuse and overconsumption of such drug.

Keywords : Hepatotoxicity, Oral Contraceptives (OCC), Insilico, Liver Dysfunction, Database.

Introduction

Hepatotoxicity induced by drug is one of the emerging challenges for clinical biology and major risk factor associated with public health (Grattagliano et al., 2002; Ladda et al., 2011; Russmann et al., 2009). Oral contraceptives are birth control medicines used to prohibit pregnancy (Srikanth and Manisree, 2013). Oral contraceptives are available in the form of pills prepared either by combination of hormones estrogen and progestin or progestin alone (Navarro and Senior, 2006; Kapp et al., 2009). Estrogen and progestin are two female sex hormones (Edmondson et al., 1976). Combinations of estrogen and progestin work by preventing ovulation (Jaffar et al., 2010). They also change the lining of the uterus to prevent pregnancy from developing and change the mucus at the cervix (opening of the uterus) to prevent sperm from entering for fertilization of egg.

Material & Methods

Data mining was extensively done from January 2011 to March 2011 of selected databases which includes Drug Bank (<http://www.drugbank.ca/>), Drugs.com (<http://www.drugs.com/>), NCBI, druginfonet.com (<http://www.druginfonet.com/>) and PubMed using following search terms - hepatotoxic agents, potential hepatotoxic oral contraceptives, drugs causing liver impairment, common hepatotoxic drugs, hepatotoxic medications, oral contraceptives, side effects of oral contraceptives, liver dysfunction associated with oral contraceptives and drugs associated liver problems. Figure 1 and 2 given bellow were the home pages of mentioned databases used for the insilico study of the present work.



Figure 1: Drugs.Com



Home Browse Search Downloads News & Updates

Search: DRUGS CAUSING LIVER DAMAGE

Search Results for "DRUGS CAUSING L

Displaying results 1 - 20 of 712 in

1 2 3 4 5 ... Next >

DB04898 — Ximelagatran

...attempt to market ximelagatran after reports of hepatotoxicity (liver damage) in countries. ... Pathway 9574101 46509040 solid H 376i95 54 Hepatotoxicity (liver) http://en.wikipedia.org/wiki/Ximelagatran

Identification Taxonomy Pharmacology Pharmacoeconomics Properties References Intera

Figure 2: Drug Bank

Results & Discussion

Oral contraceptives are the hormonal preparations consumed by ladies for preventing pregnancy. After extensive insilico study, it was found that different types of oral contraceptives include:

Monophasic Pills

This type of birth control pills contain equal amount of estrogen and progestin and should be taken by patients every day. Few monophasic pills were included in table 1 given below:

Table 1: Generic names of Monophasic pills

s.no	Generic names	Dosage form
1	Ethinyl Estradiol/ Desogestrel	Tablet
2	Ethinyl Estradiol/Drospirenone	Tablet
3	Ethinyl Estradiol/Ethinodiol	Tablet
4	Ethinyl Estradiol/Levonorgestrel	Tablet
5	EthinylEstradiol/ Norethindrone	Tablet
6	Ethinyl Estradiol/Norgestrel	Tablet

Table 4: Hepatotoxic Oral Contraceptives

S.No.	Name	S.No.	Name	S.No.	Name
1	Steroids	7	Ovulen21	13	Stilbestrol
2	Levonorgestrel	8	Azathioprine	14	Ethinylestradiol [0.05mg daily]
3	Desogesterel	9	Ovral [combination of 0.25mg d-norgestrel and 0.05 mg ethinyl estradiol drugs]	15	Lyndiol OCCs with Lynoestrenol
4	Enoxaparin	10	Ortho-Novum	16	Norethindrone
5	Enovid	11	Anovlar	17	C17-alkylated anabolic steroids
6	L-Ovral	12	Mestranol [0.15mg daily]	18	Drospirenone

Conclusion

The present work based on insilico methodology suggests that oral contraceptive pills were known to cause hepatotoxicity in ladies consuming them for prolonged time period. Although side effects of drug may vary according to individual immune potential. About 18 drugs were listed in this work and should be taken under medical supervision and expert advice. In India, uneducated as well as educated group of people used to purchase such drugs from local pharmacy shops without consulting doctors. Public health is very important issue and major concern today so beware of over consumption of such drugs.

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Biphasic Pills

This type of birth control pills release less amount of estrogen (or progestin) every day in patients for first 21 days and helps in thickening of endometrium of uterus and this is said to be the first half of the menstrual cycle. In the second half of the cycle, the hormonal ratio released in patient's body is quite higher for maintaining the normal shedding of uterus lining. Table 2 showing the generic names of some biphasic pills below:

Table 2: Generic names of Biphasic pills

s.no.	Generic Names	Dosage Form
1	Ethinyl Estradiol/ Desogestrel	Tablet
2	EthinylEstradiol/ Norethindrone	Tablet

Triphasic Pills

This type of birth control pills contains either constant or varying concentrations of hormones throughout the cycle. Few triphasic pills were mentioned in table 3.

Table 3: Generic names of Triphasic pills

s.no	Generic Names	Dosage Form
1	Ethinyl Estradiol/Levonogestrel	Tablet
2	Ethinyl Estradiol/Desogestrel	Tablet
3	Ethinyl Estradiol/Norgestimate	Tablet
4	Ethinyl Estradiol/Norethindrone	Tablet

Prolonged use of such pills can cause liver dysfunction. To cover all the oral contraceptives responsible for causing hepatotoxicity is beyond the limit of single research work, although in present research findings hepatotoxic oral contraceptive drugs were listed in the table given below [table 4].

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