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Original Research Article

Association of lichenplanus with metabolic syndrome–a case control study in a tertiary care center.

NishantSaurabhSaxena[1] NimishaSaxena[2]Animesh Saxena[3] ,Harsh Sharma[*]

[1]Assistant Professor,[1]Dept. of ENT, G.S.V.M College and Hospital , Kanpur, Uttar Pradesh, India.

[2]Associate Professor,[2]Dept. of Biochemistry, K.D Medical College and Hospital Research Center, Mathura, Uttar Pradesh, India.

[3]Associate Professor, Department of Dermatology, P.M.C.H Bhopal, India

[4]Associate professor,*Dept. of Dermatology, K.D Medical College and Hospital Research Center, Mathura, UttarPradesh, India.

Corresponding Author – Dr.Harsh Sharma,Associate Professor,Dept. of Dermatology, K.D Medical College and Hospital Research Center, Mathura, Uttar Pradesh, India.
Email I'd - drharsh1311@rediffmail.com

Abstract

Background: Lichen planus is an inflammatory papulosquamous dis-ease which affects skin and mucous membrane and cause metabolicderangements.

Methods: Thisisanhospitalbasedcasecontrolstudyduringaspanof2year(Jan2018-Dec2019)whichincludes60casesoflichenplanusand60ageandsexmatchedcontrols.Relevantclinicalhistoryandphysicalexaminationwasdoneandcollaboratedwithbloodinvestigations.DiagnosiswasmadebasedonIDFcriteria.

Results: No significant association can be established between lichenplanus and metabolic syndrome (p=0.278) Although prevalence ofhypertension was higher in cases as compared to controls (36% vs. 26%,p=0.027) , TG levels (12% vs. 6%, p=0.030 and low HDLC levels (47%vs.33%,p=0.039).NosignificantassociationwasestablishedbetweenFBSandwaistcircumferencewithlichenplanus.

Conclusions: Although no significant association can be establishedbetween lichen planus and metabolic syndrome but its components suchashypertension,TGandHDLCwerefoundtobeassociatedwithLPasperthestudy.Therefore screeningoftheseparametersinLPpatientsisnecessarytoavoidfuturecomplicationsinthesepatients.

Keywords: Lichen planus, Metabolic syndrome, Hypertension, Triglyc-eride

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Introduction

Lichenplanusderivesitsnomenclaturefromagreekword "Leichen"(1) is an inflammatory papulosqua-mous disease affecting skin and mucous membrane apapulosquamous disease. Dr. Wilson described it asan inflammatory disorder involving stratified squa-mous epithelium of unknown etiology(2). In 1895,Weyl demonstrated Wickham Striae i.e (reticulatewhitelines)onthesurfaceoflichenplanuslesions(3)

Lichenplanusisaninflammatorydisorderwhichaf-fectsskinandmucoussurfacesandcharacterizedbyflat-topped violaceous polygonal papules which co-alesce to form plaques(4). It is an sub-acute chronicdermatosisofidiopathicoriginandtriggeredbysev-eral factors such as drugs, chemical allergens andviruses(5,6).

It is an inflammatory disorder mediated by T cellscausing alteration in lipid metabolism thereby in-creasing serum triglycerides and decrease in serumHDL levels (7). It also affects endocrine functionsandcausediabetesmellituswhichmaycontributeto development of lichen planus. In 1963, Grinspanshowed the association of oral lichen planus anddiabetes mellitus and hypertension and named thesyndromeasGrinspansyndrome(8).

Metabolic syndrome is defined as group of disor-ders or derangements comprising of dyslipidemia,hypertension, impaired glucose tolerance and ab-dominalobesity.Metabolicsyndromeisassoci-atedwithmanydermatologicalconditionssuchaspsoriasis,androgeneticalopecia,SLEetc(9).Me tabolicsyndromeisalsofoundtobeassociated

with lichen planus. International Diabetes Feder-ationCriteriahasbeenusedtodefinemetabolicsyndrome in this study. Chronic inflammation andelevated proinflammmatory

cytokines are the hall-mark of metabolic syndrome. Proinflammatory cy-tokines like Leptin, adiponectin, TNF-αnterleukin-6,monocyte chemotactic protein-1 plays the majorroleindevelopmentofmetabolicderangements.These cytokines produces insulin – resistance andmetabolic complications like elevated blood pres-sure,dyslipidemiaandheartdisease.Thesearemoreoften found to be increased in many dermatologicaldiseases(10).

Oxidative stress is also an important factor in de-velopment of metabolic syndrome. Oxidative stressresultswhenthereactiveoxygenspeciesexceedsthecapacity of antioxidants.One of the major source ofROS is xenobiotics which includes chemical cosmet-ics, environment pollutants, drugs and food flavoringagents.Skinisinvolvedinmetabolisingthesexeno-biotics and other endogenous bioactive substancesfrom the body .It excretes these substances in theform of sebum. Derangements affecting the excre-tion of these in the form of sebum will increasecirculating lipids and cholesterol and results in dys-lipidemiaandmetabolicdistress. (9-11).

Methods

This case control study was conducted in k.d medical and hospital and research centre

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incollaboration with G.S.V.M medical college kanpur .Patients attend-ing OPD in DVL and ENT (for oral lichen planuscases) were enrolled in the study for a period of 2years (Jan 2018-Dec2019).Institutional ethics com-mittee was taken before start of the study .Patientsabove 18 years of age were taken and matched withthe controls without any dermatological ailments.Pregnant women, lactating mothers and persons onimmunosuppressant or on the treatments of lichenplanus were excluded.120 patients were included inthe study out of which 60 were included in the LP pa-tientsand60werecontrols.Relevantclinicalhistoryand demographic data for patients were collected ineachgroupLater the parameters of metabolic syndrome weremeasured in each patient of both groups. Severalparameters which defines metabolic syndrome weremeasured like waist circumference ,blood pressureboth systolic and diastolic and fasting glucose (12-hour fasting), lipid profile including serum choles-terol, LDLC,HDLC and TG levels. Waist circum-ference was measured at the mid-point between thelower margin of the last palpable rib and the iliaccrest(12). Photographs of the lesions were taken.Prior to inclusion in the study informed consent hasbeentakeninboth thegroups.

Data for both the groups were taken in a proformasheetandstatiscallyanalysedusingSPSSversion20(IBMSPSS,US).Pearson'schisquaretestwasusedto statically analyse the results and find prevalenceandassociationofmetabolicsyndromeinlichenplanuspatientgroupandcontrolswithoutlichenplanus.

Results

The majority of patients belong to age group of 40sand 60s (Figure 1). Out of 60 patients of LP 18 (30%)were males and 42(70%) were females Out of the40 cases of LP, 10 (25%) were males and 30 (75%)werefemales(Figure2)withmeanageofthestudypopulationbeing 41.53±13.54yrs.

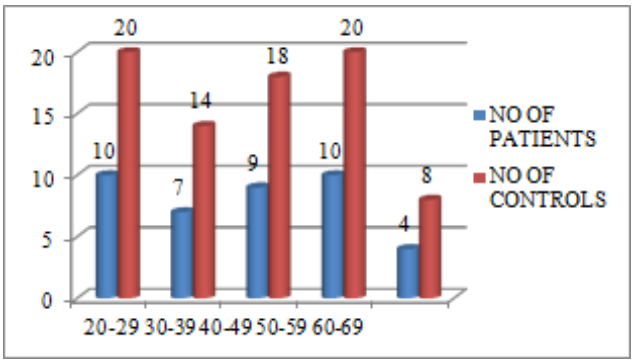

FIGURE 1: Age distribution among patients withand without LP

Clinicalpatternsoflichenplanusinthestudy

Amongthe60patientswithLP,4(7%)patients had oral lesions alone, 4 (7%) patients had scalp52 (86.6%) patients had skin lesions. 3 patients (5%) patients had nail involvement along with skin lesions and 3 (5%) patients had oral lesions along with skin lesions

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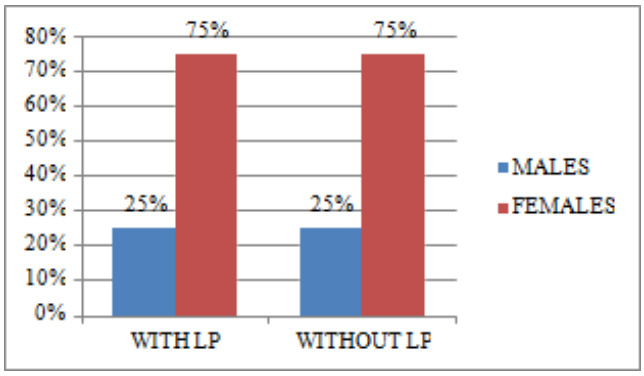

FIGURE 2: Gender distribution among patients with and without LP

Among 60 patients with LP, 20 (33%) patients hadmetabolicsyndromewhencomparedto40(67%)individuals without LP (p=0.278). Among patientswithmetabolicsyndrome,majority ofthosewithLP belonged to the age group between 50-59 years(38.88%)whilethoseincontrolgroupbelongedto40-49yearsand50-59years(28.12%each).Of the patients with LP, metabolic syndrome wasfound in 14 females (77.8%) and 4 males (22.2%)(p=0.714).Inthecontrolgroup,metabolicsyndromewaspresentin6(19%)malesand26(81%)females.

TABLE1:Lichenplanusanditsassociations

S. no	Parameter	Present	Ab-sent	
1	Increasedwaist circumference	28	32	0.599
2	Hypertension	22	38	0.027
3	RaisedFBS	19	41	0.359
4	LowHDLC level	28	32	0.039
5	Hypertriglyceridemia	12	48	0.03

lesionsalone(lichenplanopilaris)whileremainingAmong60LPpatients22(36%)wereofhypertension-sionandincontrolgroup16(26%)(p=0.027). ofthe 22 patients with hypertension in the LP group,20(89.5%) were females and 2(10.5%) were males.Increased fasting blood sugar level in patients withLP were 21(35%) as compared to 33(55%) in con-trol groups respectively(p=0.359). Similarly Triglyc-eride levels were found to be raised in 12 (20%)patientswithLPascomparedtocontrol6(10%)(p=0.030). HDLC level was found to be low in patientswith LP. Among 40 patients with LP, 28 (47%) ascompared to 20(33%) individuals among the controls(p=0.039).. Waist circumference was found to behigher in 28 (47%) and 25 (42%) individuals. withand without lichen planus respectively (p=0.599)(Table 1).Hence hypertension, hypertriglyceridemiaand low HDLC levels were found to have

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statisticallysignificantassociationwithlichenplanuswithpvaluesof0.027,0.03and0.039respecti vely.

Discussion

LichenplanusisaninflammatorydisorderinvolvingT cells for pathogenesis .It affects skin and mucousmembrane.Itsassociationwithmetabolicsyndromehasbeenstudiedsincelongbuttherear eseveralcon-tradictions in various studies so more concrete androbuststudywithlargestudypopulationisneeded .Metabolic syndrome comprises of increased bloodpressure,elevatedTGandlowHDLC,hypercholes-terolemia,derangedfastingbloodsugar,centralobe-sity. Few studies have shown that LP is associatedwithHepCinfectionwhilefewhavedisprovedit.[13–15]One study has also showed an associationbetweenhashimotosthyroiditisandlichenplanus.[16]

Few studies have shown higher association of LPwith metabolic syndrome while some refutes thesame(17).

This study was done to give some insight whetherLP shows any association with metabolic syndromeornot.Thoughmorestudiesareneededtopotentiatethisassociation.

Demographicdetails

Age

In this study out of 60 patients with LP majority ofpatientsfallintheagegroupof40sand60s.with

the mean age of patients with LP was 41.5313.54yrs (median= 41 and range=45) which was matchedforageandgenderwithcontrolgroupwhichshowedmean age of 41.4313.45 yrs ± (median= 41.50 andrange=45).Theresultsofthisstudywerefoundtobe similar with

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study done by Omal et al done insouthIndianpopulation(18)similarlythestudydonebyMehdipouralsoshowedthesametrend(19).

Maximun number of Patients with LP with metabolicsyndrome fall into sixth decade while in the con-trol group maximum number of individuals withmetabolic syndrome belong to fifth and sixth decade.While Prasad et al showed highest prevalence inseventhdecade(20).

Gender

Out of 60 patients, 42 (70%) were females and 10(30%) were males. Although in this study femalepredominancewasseenbutthiswasnotfoundtobe statiscally significant . Parihar et al also foundfemale predominance in his study (1:0.8)(21). 14females(77.8%)and4males(22.2%)werefoundtobeassociatedwithmetabolicsyndromeagai nthisshowsfemalesareaffectedmorewithcomplicationscompared to males. Balasubramaniam et al showedinhisstudythat60%offemalesinIndiawerefoundtohavemetabolicsyndrome(22).

ISSN:0975-3583,0976-2833 VOL13,ISSUE05,2022

Metabolicsyndrome

AmongthepatientswithLP;14females(77.8%)and4 males (22.2%) had metabolic syndrome. While incontrol group metabolic syndrome was present in 6(19%) males and 26 (81%) females. No significantassociation was found between LP and metabolicsyndrome(p=0.278).

Similartothisstudy,onelargerstudywith100participants was taken by Arias et al . In their studyaccording to ATP III criteria for MS, only 27% ofpatients with lichen planus had MS while the con-trolgrouphad20%.Thiswasstatiscallyinsignificantwithpvalue0.310(7).

Baykaletalinastudyshowedthatoutof79patientsof LP 26% had metabolic syndrome compared to12% in control group. They have also shown thatmucosal LP was more associated with metabolicsyndrome(17).

Bloodpressure

Out of 60 patients in study group 22 had hyperten-sion patients of which, 20(89.5%) were females and2(10.5%) were males while only 16 had hypertensionincontrolgroup.Thiswasstatiscallysignificantwithpvalue0.027Themeansystolic BPamongthe cases and controls were 125.7±12.9 mmHg and117.58±15.3 mmHg respectively while the meandiastolic BP was 83.2±5.84 mmHg within the casesand 75.2±8.37 mmHg among thecontrol group.

SimilarresultswereobservedbyBaykeletalintheirstudy with 26 (32.9%) of 70 LP patients sufferingfromhypertensionwithapvalueof0.027(17).

However this was not in accordance with the studydone by Salvador Arias-Santiago et al were theycould not prove any association between LP andhypertension(7).

Fastingbloodsugar

Inthisstudy,increasedfastingbloodsugarlevelinpatientswithLPwere21(35%)ascomparedto 33(55%) in control groups respectively(p=0.359)this is statiscally The mean FBS among the LP pa-tientswas103.0329.25mg/dlandthesameamongthecontrolgroupwasfoundtobe97.1528.25mg/ dl. ± ∓

But contrary to this Atefi et al ha∓e shown higherprevalence of diabetes mellitus in LP patients ascompared to control(23).Findings similar to AtefiwerefoundbyBaykeletal(17).Grinspanalsofoundhigher prevalence of diabetes mellitusandhyperten-sion in patients with oral erosive LP and named itGrinspansyndrome(24).

Serumlipids

Similarly triglyceride levels were found to be raisedin12(20%)patientswithLPascompared

tocontrol6 (10%) (p= 0.030). HDLC level was found to below in patients with LP. Among 40 patients withLP,28(47%)ascomparedto20(33%)individu-als among the controls (p=0.039). The mean valuesoftriglyceridelevelswere131.3337.1mg/dland 116.7137.7mg/dlamongcases∓andcontrolsinthisstudyaswell ThemeanHDLClevelswere44.6 7.34mg/dland

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46.766.26mg/dlamongthecasesandcontrolsrespectively.Mehdipour et al carried a study with 88 participantsConstructed three groups with 22 patients in eachgroup.first group was of erosive oral LP, second ofnon-erosive oral LP and third of healthy individu-als.When compared to controls statiscally significantrelation was found between increased TG and lowHDLClevelsinpatientsgroupwithapvalueof0.00and0.02respectively(19).

StudydonebySarkaretalalsosupportsthiswiththesimilarfindingsdoneon25LPpatientswithage andgender matched controls. Along with altered HDLCand triglyceride levels, LDL levels were also foundtobehigherinthisstudy(25).

Waistcircumference

Waist circumference was found to be higher in 28(47%) and 25 (42%) individuals with and withoutlichen planus respectively (p=0.599) but this wasstatiscallyinsignificantassuggestedbypvalue.

The mean waist circumferences of the patients withand without LP were found to be 86.63±12.07 cmand86.86±9.03cm respectively.

Conclusion

Based on this study it can be concluded that asso-ciation of LP with metabolic syndrome was satatis-cally insignificant whereas individual parameters ofmetabolic syndrome when studied and comparedwith the control group showed different results .hy-pertension was statiscally significant in LP patientsas compared to control group also the lipid profilewas found to deranged more oftenly in LP patientssignificantlyinpatientswithoralerosiveLPascom-pared to control group whereas waist circumferenceand fasting blood sugar was not statiscally significantwhen compared with the control group. Howeverscreening of patients of LP for these parameters isimportanttopreventfuturecomorbiditiesandensureabetterlife.

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