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Study about hypothyroidism in Al-Marj city

[1]Dr. Gasem M. A. Abdalla, [2]Dr. Abdullah A. H. Algassi, [3]Dr. Salah M. A. Abdalgalel, [4]Dr.Rajab S. M. Mashathi

1,2,3,4. Medical Laboratory Department, High Institute of Medical Sciences and Technologies, El-Marj-Libya

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Abstract:

Hypothyroidism is one of the most common chronic endocrine conditions. However, as symptoms of hypothyroidism are non-specific, up to 60% of those with thyroid dysfunction are unaware of their condition. Left untreated, hypothyroidism may contribute to other chronic health conditions .This study aimed to determine distribution, determinants, and relation of some demographic characteristics of people in the El-Marj city in occurring of hypothyroidism . The research was carried in EL-Marj city, which is located in north eastern Libya . It lies in an upland valley separated from the Mediterranean Sea by a range of hills, part of the Jebel Akhdar Mountains.

Cross sectional study, Study units were sample of 139 hypothyroidism patients attending endocrinological clinics in El-Marj city in Libya. Data were collected by means of a semi-structured (Appendix I) questionnaire developed in Arabic language. The study is conducted during period from 1/4/2021 to 1/6/2021 . During the period of the survey, 139 hypothyroidism patients attending endocrinological clinics in El-Marj city in Libya completed the questionnaire. The distribution of participant according to show most period of age in the study is (45-59 y) 50 % . Interestingly, the female is the predominant sex for occurring of this disease 93 % . Hypothyroidism is a common and often under diagnosed disease in the Libya in general countries. The prevalence of hypothyroidism varies with age, sex and co-morbidities such as diabetes and rheumatoid arthritis.

Keywords: Hypothyroidism, Thyroid gland, El-Marj-Libya.

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دراسة حول قصور الغدة الدرقية في مدينة المرج

[1]قاسم محمد عطية عبدالله، [2]عبدالله علي حامد القاسي، [3]صلاح محمد علي عبدالجليل، [4]رجب سعيد مفتاح مشاظي.
1،2،3،4. قسم المختبرات الطبية , المعهد العالي للعلوم و التقنيات الطبية - المرج - ليبيا

الملخص

قصور الغدة الدرقية هو أحد أمراض الغدد الصماء المزمنة الأكثر شيوعاً. ومع ذلك، نظرًا لأن أعراض قصور الغدة الدرقية غير محددة، فإن ما يصل إلى 60٪ من المصابين بخلل في الغدة الدرقية لا يدركون حالتهم. إذا ترك قصور الغدة الدرقية دون علاج فقد يساهم في الإصابة بحالات صحية مزمنة أخرى.

هدفت هذه الدراسة إلى تحديد توزيع ومحددات وعلاقة بعض الخصائص الديموغرافية لسكان مدينة المرج في حدوث قصور الغدة الدرقية. تم إجراء البحث في مدينة المرج الواقعة شمال شرق ليبيا. تقع في وادي مرتفع منفصل عن منطقة المرج، كان نوع الدراسة مقطعية، كانت وحدات الدراسة عينة مكونة من 139 مريضًا يعانون من قصور الغدة الدرقية الذين يترددون على عيادات الغدد الصماء في مدينة المرج في ليبيا. تم جمع البيانات عن طريق استبيان شبه منظم (الملحق الأول) تم تطويره باللغة العربية. تجرى الدراسة خلال الفترة من 2021/4/1 إلى 2021/6/1 خلال فترة المسح، قام 139 من مرضى قصور الغدة الدرقية الذين يترددون على عيادات الغدد الصماء في مدينة المرج في ليبيا بإكمال الاستبيان. توزيع المشاركين حسب معظم فترات العمر في الدراسة هو (45-59 سنة) ومن المثير للاهتمام أن الأنثى هي الجنس السائد لحدوث هذا المرض بنسبة 93%. قصور الغدة الدرقية هو مرض شائع وغالباً ما لا يتم تشخيصه في ليبيا بشكل عام. يختلف انتشار قصور الغدة الدرقية باختلاف العمر والجنس والأمراض المصاحبة مثل مرض السكري والتهاب المفاصل.

الكلمات المفتاحية: قصور الغدة الدرقية، الغدة الدرقية، المرج -ليبيا.

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INTRODUCTION:

Thyroid.hormones.act.on.almost.all.nucleated.cells.and.are.essential.for.normal.growth.and.energy.metabolism,**.(Dumont,.et.al.,.2011)**..Thyroid.dysfunction.is.common,.readily.identifiable.and.easily.treatable,.but.if.undiagnosed.or.untreated,.it.can.have.profound.adverse.effects.**(Chaker,.et.al.,.2017)**...Despite.an.increase.in.thyroid.disease.awareness.and.the.availability.of.sensitive.laboratory.assays.for.the.measurement.of.thyroid.hormones,.cases.of.extreme.thyroid.dysfunction.occasionally.still.occur.**(Taylor,.et.al.,.2015)**..Hypothyroidism.and.hyperthyroidism.commonly.arise.from.pathological.processes.within.the.thyroid.gland.(primary.thyroid.disease),.although.in.rare.cases,.they.can.arise.from.disorders.of.the.hypothalamus.or.pituitary.(central.hypothyroidism).or.from.peripheral.causes,.such.as.Struma.ovarii,.or.functional.thyroid.cancer.metastases.**(Persani,.201)**

In.iodinereplete.populations,.thyroid.dysfunction.is.most.commonly.due.to.thyroid.autoimmunity..The.autoimmune.thyroid.disorders.comprise.Graves.disease,.Hashimoto.thyroiditis.and.postpartum.thyroiditis,.in.which.the.presence.of.circulating.thyridspecific.auto.reactive.antibodies.is.characteristic..Solitary.or.multiple.autonomous.nodule.formation.within.the.thyroid.gland.are.also.frequent.causes.of.hyperthyroidism,.while.less.common.causes.include.thyroid.gland.inflammation.or.thyroiditis.and.adverse.effects.of.medication,.such.as.amiodarone.and.lithium..Both.iodine.deficiency.and.excess.can.result.in.hypothyroidism.as.well.as.hyperthyroidism.**(Taylor,.et.al.,.2018)**.

The.clinical.presentation.of.thyroid.disease.is.highly.variable.and.often.nonspecific;.therefore,.the.diagnosis.of.thyroid.dysfunction.is.predominantly.based.on.biochemical.confirmation..The.complex.inverse.association.between.the.pituitaryderived.TSH.and.T4.and.T3.renders.TSH.the.more.sensitive.marker.of.thyroid.status.**(Chadlow,.et.al.,.2013)**..Accordingly,.overt.hypothyroidism.is.defined.TSH.concentrations.above.the.reference.range.and.free.T4.levels.below.the.reference.range,.while.subclinical.hypothyroidism.is.defined.as.TSH.levels.above.the.reference.range.when.lev

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els.of.free.T4.are.within.the.populati on.reference.range.**(Pearce,.et.al.,.20 13)**..Likewise,.the.reverse.hormone.p attern.is.applied.in.the.definition.of.o vert.(low.TSH.and.high.T4).and.subc linical.hyperthyroidism.(low.TSH.an d.normal.T4)..

Iodine.is.an.integral.componn t.of.thyroid.hormones,.but.the.global. distribution.of.iodine.is.uneven,.mea ning.some.areas.are.iodine.rich,.whil e.other.are.iodine.deficient.**(Zimmer mann,.2009)**..Over.a.billion.people. worldwide.live.in.an.iodinedeficient. area,.with.the.populations.at.greatest. risk.residing.in.remote.mountainous. egions,.such.as.in.Southeast.Asia,.So uth.America.and.Central.Africa.**(Van derpump,.2011)**..Population.differen ces.in.iodine.nutrition.have.a.major.r ole.in.the.global.prevalence.of.thyroi d.dysfunction..Nodular.thyroid.disor ders.are.more.prevalent.in.areas.wher e.iodine.deficiency.is.more.common, .while.autoimmune.thyroid.disorders, .including.Hashimoto.thyroiditis.and. Graves.disease,.occur.more.frequentl y.in.iodinereplete.populations;.howe ver,.a.multitude.of.other.risk.factors,. including.genetic.**(Medici,.et.al.,.201 4)**and.ethnicsusceptibility.**(Sichieri,. et.al.,.2007)**,.sex.**(De.Groot,.et.al.,.2 012)**,.smoking.status.**(Wiersinga,.20 13)**,.alcohol.consumption.**(Zimmer mann,.2009)**,.presence.of.other.autoi mmune.conditions.**(Boelaert,.et.al.,. 2010**),.syndromic.conditions.**(Pearce ,.et.al.,.2017)**.and.exposure.to.some.t herapeutic.drugs**.(Shine,.et.al.,.2015)**

CLINICAL.PRESENTATION:

The.clinical.signs.and.sympto ms.of.hypothyroidism.may.be.broad. and.nonspecific.and.vary.from.patien t.to.patient..Common.symptoms.incl ude.fatigue,.menstrual.irregularities.a nd.lack.of.concentration,.while.other. symptoms.associated.with.hypothyro idism.may.include.cold.intolerance,.c onstipation.and.hair.loss,.among.othe rs.**(Islam,.et.al.,.2017)**..The.number. of.these.symptoms.a.patient.has.refle cts.the.degree.of.thyroid.dysfunction. **(Canaris,.et.al.,.1997)**.

The.clinical.signs.of.hypothyr oidism.may.include.(but.are.not.limit ed.to).oedema,.weight.gain,.goitre,.c ognitive.impairment.and.delayed.rela xation.phase.of.deep.tendon.reflexes. .Laboratory.results.may.show.elevate d.C-

reactive.protein,.hyperprolactinaemia,.hyponatraemia,.increased.creatine.kinase,.increased.low-density.lipoprotein.(LDL).cholesterol,.increased.triglycerides,.normocytic.anaemia.and.proteinuria.**(Ladenson,.et.al.,.2000)**..Possible.electrocardiography.findings.include.bradycardia,.low.voltage.and.flattened.T-waves..Clinical.presentation.of.severe.hypothyroidism.can.be.confused.with.septic.shock,.with.clinical.signs.including.pericardial.effusion,.pleural.effusion,.haemodynamic.instability.and.coma.**(Islam,.et.al.,.2017)**.

.Management.of.Hypothyroidism:

....Currently,.the.treatment.of.choice.for.hypothyroidism.is.levothyroxine.sodium.due.to.its.efficacy,.favourable.safety.profile,.ease.of.administration,.good.intestinal.absorption,.long.serum.half-life.and.cost-effectiveness.**(Verloop,.et.al.,.2012.and.Jonklaas,.et.al.,.2014)**..Synthetic.levothyroxine.sodium.is.indicated.for.replacement.of.thyroid.hormones.in.primary,.secondary.or.tertiary.congenital.or.acquired.hypothyroidism..Levothyroxine.acts.as.an.endogenous.thyroxine.once.absorbed.and.undergoes.deiodination.to.the.biologically.active.triiodothyronine.(T3).**(Persani,.et.al.,.2000.and.Abbott.Laboratories,.2018)**..Although.the.majority.of.patients.with.hypothyroidism.respond.to.levothyroxine.treatment,.some.individuals.experience.persistent.symptoms.despite.adequate.serum.thyroxine.correction..The.combined.use.of.levothyroxine.and.liothyronine,.a.synthetic.form.of.T3,.has.been.investigated.in.patients.who.have.persistent.symptoms.of.hypothyroidism.with.levothyroxine.monotherapy;.however,.there.is.inconsistent.evidence.of.the.superiority.of.combination.therapy.over.monotherapy.with.levothyroxine.**(Jonklaas,.et.al.,.2014)**.

Levothyroxine.monotherapy.in.solid.formulation,.taken.on.an.empty.stomach,.is.the.treatment.of.choice..The.presence.of.clinical.features.of.hypothyroidism,.with.biochemical.confirmation.of.overt.hypothyroidism,is.the.indication.for.treatment.initiation..No.rationale.exists.for.avoiding.the.prescription.of.generic.preparatio but.switches.between.levothyroxine.products.in.patients.who.are.stable.are.not.recommended.**(Jonklaas,.et.al.**

,.2014)..The.optimal.daily.dose.in.overt.hypothyroidism.is.1·51·8.µg.per.kg.of.bodyweight..In.patients.with.coronary.artery.disease,.the.starting.dose.is.generally.12·525·0.µg.per.day.and.should.be.gradually.increased.on.the.basis.of.symptoms.and.TSH.concentrations..This.regimen.is.often.preferred.in.the.elderly,.especially.in.patients.with.many.comorbidities.**(Jonklaas,.et.al.,.2014)**..In.younger.patients.without.comorbidities,.the.full.dose.can.usually.be.given.from.the.start.with.adequate.monitoring.to.avoid.overtreatment..After.the.initiation.of.therapy,
TSH.measurement.is.repeated.after.4 12.weeks.and.then.every.6.months.and,.once.stabilised,.annually..Adjustments.should.be.made.according.to.laboratory.findings,.keeping.in.mind.that.in.some.patients.(i.e.,.those.with.low.bodyweight.or.older.patients).small.changes.in.dose.can.have.substantial.effects.on.serum.TSH.concentrations..The.clinical.significance.of.low.triiodothyronine.concentrations.in.some .patients.despite.reaching.normal.TSH.concentrations.is.unknown..Routine.measurement.of.triiodothyronine.should.not.be.used.to.assess.treatment.effectiveness.**(Abdalla.and.Bianco,.2014)**.

OBJECTIVE:

This.study.aimed.:

1.To..determine.distribution,.determinants,.and.relation.of.some.demographic.characteristics.of.people.in.the.ElMarj.city.in.occurring.of.hypothyroidism.

2.To.idemtify.the.relationship.between.the.age.and.hypothyrodisim.

3.To.idemtify.the.relationship.between.the.gender.and.hypothyrodisim.

4.To.idemtify.the.relationship.between.the.family.history.and.hypothyrodisim.

5.To.idemtify.the.relationship.between.the.occupation.of.patients.and.hypothyrodisim.

6.To.idemtify.the.relationship.between.the.immunopathy..and.hypothyrodisim.

METHODOLOGY

Materials.and.methods

1.Site.of.study.:.the.research.was.carried.in.ELMarj.city,.which.is.located.in.north.eastern.Libya...It.lies.in.an.upland.valley.separated.from.the.Medi

terranean.Sea.by.a.range.of.hills,.part.of.the.Jebel.Akhdar.Mountains..It.has.an.estimated.population.of.111370according.to.civilian.registry.of.the.city.2012.

2.Type.of.study.:Cross.sectional.study

3.Units.of.the.study.:. Study.units.were.sample.of.139.hypothyroidism.patients.attending.endocrinological.clinics.in.El-Marj.city.in.Libya..

4..Data.collection.:.Data.were.collected.by.means.of.a.semi-structured.(Appendix.I).questionnaire.developed.in.Arabic.language..

5..Study.period.:.the.study.is.conducted.during.period.from.1/4/2021.to.1/6/2021

6..Statistical.analysis.:. Descriptive.statistics.as.mean,.median.and.mode.were.used..Data.were.presented.in.form.of.tables.and.figures,.were.the.figures.done.by.SPSS.version.21.and.excel..

Results:

This.study.was.conducted.between.1/4/2021.and.1/6/2021.in.endocrinology.clinics.in.the.city.of.Al-Marj.-.Libya.

From.the.data.recorded.in.table.(1).and.fig..(1).It.is.clear.that.most of.the.cases.observed.with.this.diseae.were.aged.from.45..50.(17.%),50..55.(16.%),.and.55..59.(17.%),.which.equates.to.a.total.of.50%.from.the.age.of.45.to.59.There.are.only.3.cases.(2.2.%)..out.of.139.who.were.infected.with.the.hypothyroidism.from.birth.

Table.(1).Is.this.disease.from.birth?

		Frequency	Percent	Valid.Percent	Cumulative.Percent
Valid	Yes	3	2.2	2.2	2.2
	No	136	97.8	97.8	100.0
	Total	139	100.0	100.0	

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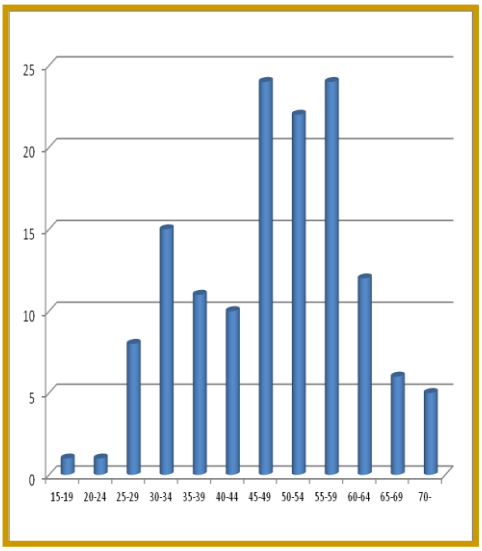

Figure.(1):.Distribution.of.the.sample .according.to.the.age.of.the.participnt

From.the.inspection.of.the.data.presented.in.and.fig..(2),.the.female .is.the.predominant.sex.for.occurring. of.this.disease.93.%,.while.the.percentage.of.men.infected.with.the.disease.did.not.exceed.7%,.out.of.a.total.of. 139.cases.of.thyroid.disorder.

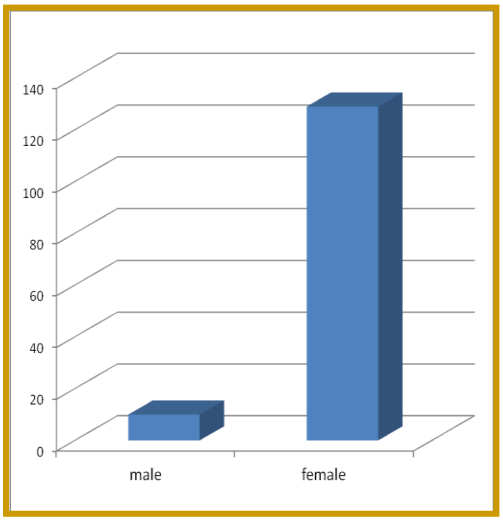

Figure.(2):.Distribution.of.the.sample .according.to.the.gender.of.the.participant

Data.recorded.for.the.any.imunopathy.are.presented.in.table.(2).and.fig..(3)it.was.found.that.diabetes.was.present.in.36.cases.(25.9.%).out.of .139.cases,.and.10.patients.(7.2.%).had.rheumatoid.arthritis,.and.4.patients.(2.9.%).had.both.diseases.(diabetes. and.rheumatoid.arthritis),While.it.was.found.that.85.cases.(61.2.%).did.not.suffer.from.any.disease.associated. with.hypothyroidism.and.hyperthyroidism,.With.1.case.(0.7.%).abstaining. from.answering.

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Table.(2).:.If.there.is.any.immunopathy					
		Frequency	Percent	Valid.Percent	Cumulative.Percent
Valid					
	Diabetes	36	25.9	25.9	26.6
	No	85	61.2	61.2	87.8
	no.answer	1	.7	.7	88.5
	Rheumatoid.arthritis	10	7.2	7.2	95.7
	Diabetes.and.Rheumatoid.arthritis	4	2.9	2.9	98.6
	Other	2	1.4	1.4	100.0
	Total	139	100.0	100.0	

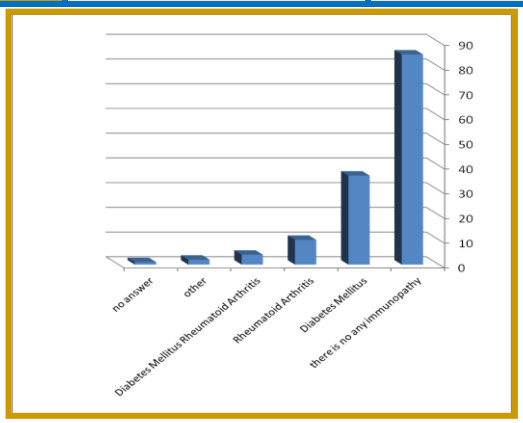

Figure.(3):.there.is.any.immunopathy.Out.of.a.total.of.139.cases,.124.case.(89.2.%).were.found.to.have.hypothroidism,and.15.cases.(10.8.%).were.found.to.be.suffering.from.hyperthyroidism,.As.shown.in.table.(3).and.fig.(4)..

Table.(3).the.type.of.disease					
		Frequency	Percent	Valid.Percent	Cumulative.Percent
Valid	Hypothyroidism	124	89.2	89.2	89.2
	Hyperthyroidism	15	10.8	10.8	100.0
	Total	139	100.0	100.0	

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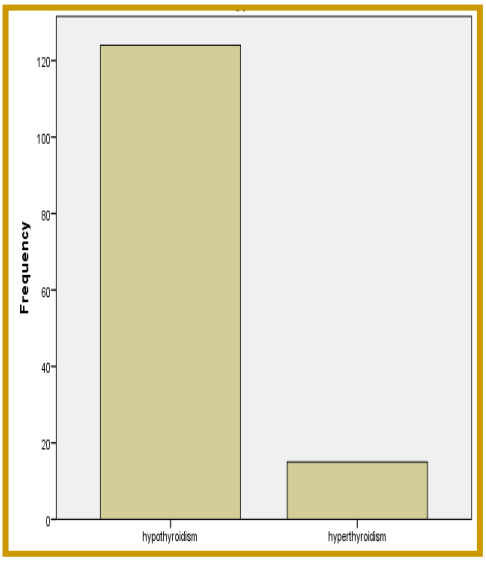

Figure.(4):.types.of.disease.In.this.study,.it.was.found.that.most.patients.with.thyroid.disorders.were.using.the.same.treatment.(levothyroxin).125.patients.(89.9.%),.which.is.considered.the.most.common.treatment.among.patients.with.hypothyroidism,.and.it.comes.in.second.place.(Carbimazole5.mg)."tablets",.12.cases.(8.6.%),.and.two.patients.(1.4.%).also.did.not.give.any.answers,.as.recorded.in.table.(4).and.fig.(5).

Table.(4).the.type.of.treatment

		Frequency	Percent	Valid.Percent	Cumulative.Percent
Valid		2	1.4	1.4	1.4
	Levothyroxine	125	89.9	89.9	91.4
	other.(Carbimazole.5.mg.Tablets)	12	8.6	8.6	100.0
	Total	139	100.0	100.0	

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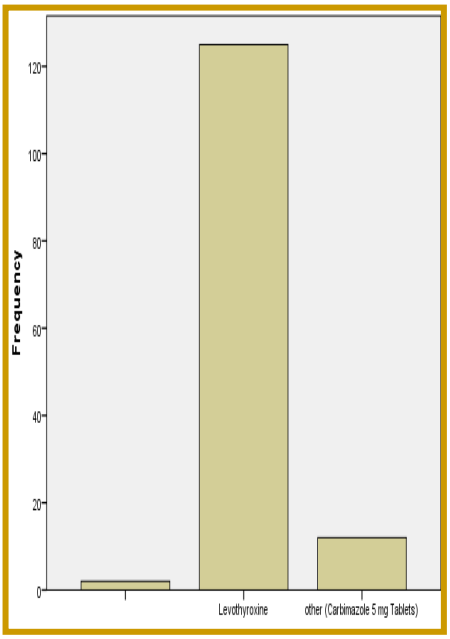

Figure.(5):.types.of.treatment

The.study.also.showed.that.te .incidence.of.the.disease.is.high.betw een4049.years.old.(almost.50.cases). at.a.rate.of.36.%,.then.those.between. the.ages.of.3039.years(equivalent.to. 29.cases).at.a.rate.of.21%,.At.a.rate.o f.20.%.(about.28.cases).from.the.age s.of.2029.years,.followed.by.a.rate.of .approximately.15.%.(21.patients).fr om.the.ages.of.5059.years,.a.rate.of.5 .7.%..(8.cases).from.the.ages.of.6069 .years,.and.finally.at.a.rate.of.about.2 .3.%.(3.cases).from.the.ages.of.1019. years.

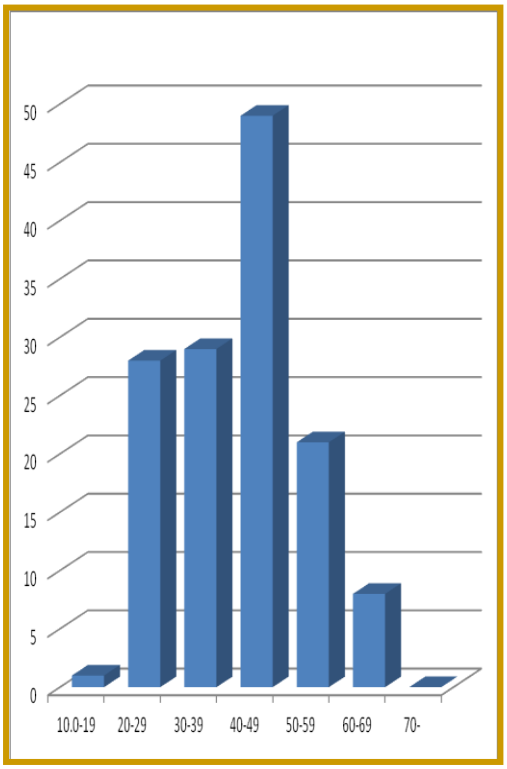

Figure.(6):.Distribution.of.the.sample .according.to.the.answer.of.question(which.age.did.the.disease.start?)

From.the.scrutiny.of.the.data. presented.in.and.fig..(7),.the.study.al so.showed.that.69.%.of.the.patients.h ad.no.family.history.of.hypothyroidis m,.while.25.%.of.them.had.a.mother. who.had.the.disease,.at.the.same.tim e.it.was.found.that.4.3.%.were.relate d.to.the.father,.and.1.7.%.were.relate d.to.both.the.father.and.the.mother.

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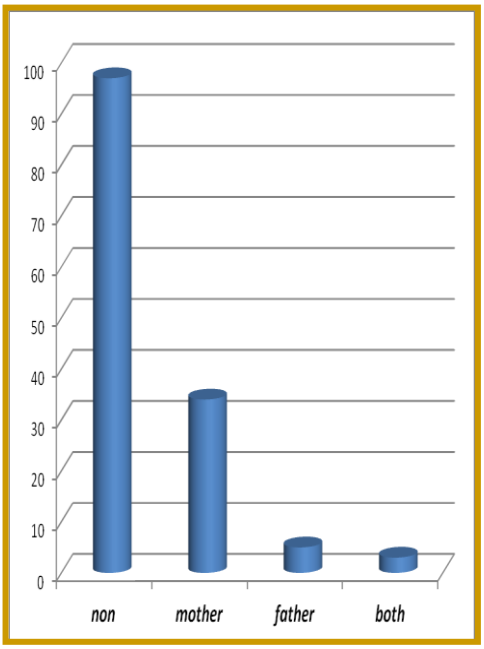

Figure.(7):.Distribution.of.the.sample.according.to.the.family.history.of.the.disease

In.fig..(8).were.noticed.that.the.year.in.which.the.highest.incidence.of.thyroid.disorders.was.recorded.was.the.year.2017.(19.cases),.followed.by.the.year.2018.(18.cases), then.the.year.2019.(15.cases),.and.followed.by.a.lower.percentage.in.the.year2016.(12.cases).

A.much.lower.infection.rate. was.recorded.in.each.of.the.following.years(1981,.1994,.1991,.1995,.2000,.2001,.2008,.and.finally.2021),.at.rate.of.one.case.per.year.

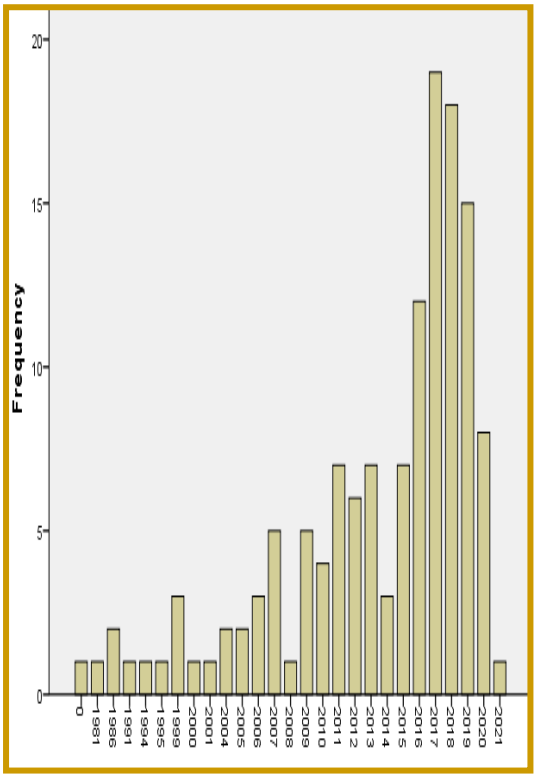

Figure.(8):.the.year.of.start.the.diseae

The.study.also.included.an.explanation.of.the.professions.most.frequently.reported.in.cases,.and.the.results.showed.that.the.housewife.was.the.most.affected,.with.a.rate.of.(43%),.followed.by.teachers,.with.a.rate.of.(23.%).of.the.total.cases,.then.the.employee.(18.7.%),.and.the.lowest.infec

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tion.rate.was.among.laboratory.technicians.(1.4.%).

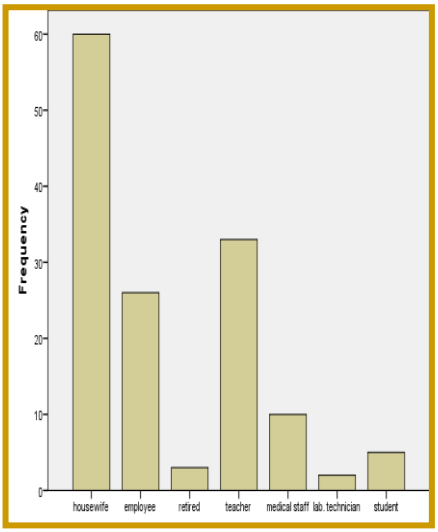

Figure.(9):.the.occupation.of.patients

DISCUSSION:

During.the.period.of.the.survey,.139.hypothyroidism.patients.attending.endocrinological.clinics.in.El-Marj.city.in.Libya.completed.the.questionnaire..The.distribution.of.participant.according.to.show.most.period.of.age.in.the.study.is45-50.17%.,.50-55.16.%.and.5559.(17%)total.equal.50.%.(45-59.y).

Interestingly,.the.female.is.the.predominant.sex.for.occurring.of.this.disease.93.%.When.it.was.asked.about.any.one.of.the.family.has.this.disease.previously.was.the.answer.that.about.69.%.of.participants.no.has.a.family.history,.while.25.%.of.them.were.their.mother.has.this.disease..als,.when.we.asked.about.which.age.was.with.a.highfrequency.occurring.onset.of.the.disease.is...period.of.age.from.40.to.49.years.are.most.one.with.percentage.36.%.then.30.to.39.(21.%).

An.association.between.diabetes.and.thyroid.disorders.has.also.been.postulated,.as.both.diseases.are.caused.by.endocrine.dysfunction.and.both.insulin.and.thyroid.hormones.contribute.to.body.metabolism;.disruption.in.either.hormone.can.impair.the.function.of.the.other..In.this.study.26%.of.the.cases.of.hypothyroidism.have.co.morbidity.with.Diabetes.Mellitus.while.in.a.case.control.study.of.100.Saudi.patients.with.type.2.diabetes.was.conducting.at.King.Abdulaziz.University.Hospital,.thyroid.autoimmunity.was.detected.in.10%.of.patients.with.diabetes.versus.5%.of.controls.**(Alzahrani,.et.al.,.2020)**..

While.rheumatoid.arthritis.occurring.in.7%.of.the.cases..The.majority.of.cases.haven't.any.comorbidity Is.there.any.Immunopathy.

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Majority.of.patients.have.no.a.family.history.of.hypothyroidism.(69%).The.maority.of.the.case.are.belong.hypothyrodism.(89%).and.remiander.are.hyper.thyrodisim.(11%)...most.cases.treat.with.levothyroxine.(91%)..In.the.other.hand.the.most.occupation.was.frequency.in.the.cases.is.housewife.(43%).and.teacher.form.23%.of.all.cases.

CONCLUSION

Hypothyroidism.is.a.common.and.often.underdiagnosed.disease.in.Libya.in.general.countries..The.prevalence.of.hypothyroidism.varies.with.age,.sex.and.comorbidities.such.as.diabetes.and.rheumatoid.arthritis.

And.predominantly.spread.in.females,.notably.the.age.period.from.45.to.55.years.that.the.most.age.which.the.disease.start.on.it.is,.and.we.alo.concluded.in.this.study.that.the.family.history.(genetic.factors.).has.no.orl ittle.effect.and.association.in.occuring.of.hypothyroidism.

RECOMMENDATIONS:

In.this.study.could.be.recommended.the.following.pointing:

1. Provide.the.treatment.for.all.patients.at.primary.health.care.center.public.pharmacy.
2. Providing.free.laboratory.services.for.examination.and.diagnosis.of.clinical.and.subclinical.hypothyroidism.and.hyperthyroidism.in.the.community.
3. Conduct.screening.for.early.detection.and..thus.participate.in.prevention.from.another.sequela.
4. Identified.risk.factors.are.potentially.modifiable,..emphasizing.the.importance.of.public.health.programs.that.are.aimed.at.tackling.such.determinants...
5. Future.longitudinal.studies.are.needed.to.investigate.the.prognosis.and.determinants.of.this.condition.in.Libya.
6. This.study.recommended.early.detection.and.prevention.of.disease.at.the.primary.level.by.educating.the.population.should.be.practiced.
7. Establishment.factory.for.production.thyroxin.and.other.thyroid.gland.medicine.in.Libya.

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