: influencing factors and microbial agents which contribute to acne among student from pathological analysis department / Kufa technical institute\ Al-Najaf government.

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Influencing factors and microbial agents which contribute to acne among student from pathological department / Kufa technical institute\ Al- Najaf government.

Abstract:

Context: Acne is not a life-threatening disease, but it can cause permanent dermal scar, it may be a source of depletion of the financial resources of the individual as well as the psychological distress that can affect a person's future life.

Aims: determine the influencing factors, grading acne severity and identify the potential microbial cause.

Methods and Material: the analytic descriptive study was performed using an interview-administered questionnaire and clinical examination for each participant. Global acne grading system was used for determining the acne severity. The sample was collected only from students who have a cane, the specimen have been processed to identify the species of microorganism.

Statistical analysis: The data were analyses by a statistical program SPSS (version 21).

Results: the prevalence of acne was (71.9%), it was more common among male compared to female (43% vs29%), there is a significant association (p>0.05) between acne and skin hygiene, family history, stress and menstrual cycle, while there is no association (p<0.05) between acne and hormonal imbalance, polycystic ovarian, sun protecting creams, cosmetic and moisture cream. sever and moderate form of acne was more common in female (2.3 %, 5% vs 0%, 3.6%), however the mild form more common in male (39.4% vs 22.2%). *Staphylococcus epidermidis* was the most bacterial isolate from specimens (28.3%).

Conclusions: acne results from overlapping more than one factor at the same time. The extent of the impact of these factors may differ from one person to another depending on regional variations in terms of the environment and lifestyle.

Key-words: acne, gender, severity, diet, menstrual cycle.

Introduction:-

First of all, let us introduce acne is a cutaneous condition encountered in the puberty period. It affects almost 85% of individuals 12-24 years of age [1], it is a very common skin problem but it is not contagious. It is characterized by the formation of nodules, pustules, papules, comedowns, blackheads and whiteheads on the skin [2]. It may be appearing in more than one place in the body such as the face, chest and back. It occurs primarily because of the increase in the production of sebum, which is produced by the sebaceous glands. This substance plays an important role in moisturizing and protecting the skin from invasion by the most bacterial species [3]. Several studies have shown that the appearance and severity of acne may be affected by several factors such as genetics, hormones, polycystic ovaries, menstrual cycle, emotional stress, diet, use sunscreen and the colonization of the skin by a species of bacteria which have the ability to metabolize the sebum [4, 5]. The presence of one or more of these factors is affecting the appearance of acne in some young people compared to their peers, as well as it controls the

degree of acne which ranges from mild infection that disappears automatically after a certain period to severe infection that may leave scars on the skin, if it is not treated properly . Adolescence is a period in which a person experiences many biological and psychological changes. Acne may make this period more difficult and lead to a variety of psychological impacts such as embarrassment, depression, anxiety, violence and lack of self-confidence, as mentioned in previous research [7].

Material and methods: -

Study design:- This is an analytical descriptive study designed to identify potential influencing factor that related to acne, grading acne severity and the microbial species that associated with acne formation.

Place of the study:- This study was conducted in the district of Kufa- Najaf province in Iraq, on a sample of students from the first and the second stage of the Department of Pathological Analysis \ Kufa Medical Technical Institute.

Sample size and study period:-The study was conducted from 5 to 29 of January. The total number of students was 350, Only 107 females and 115 males agreed to participate.

Data collection: - The research team conducted an interview with all participants to complete the questionnaire form after getting a verbal consent of the department headmasters. The questionnaire contained several parts. The first part included information about the participants, such as age, sex, personal hygiene. Use sunscreen, use cosmetics or skin care creams, Family history, stress, as well as a number of additional questions for a female. The second part concerned with the clinical examination. The third part concerned with the laboratory examination of the sample.

Clinical classification of the acne:- The clinical examination was performed by a doctor and a nurse with experience in the field of dermatology. According to criteria of global acne grading system (GAGS) [8].

Sample processing:- The samples were collected only from the participants who suffer from acne. The specimens were transferred directly to the laboratory and cultured on blood agar, sabouraud dextrose agar with olive oil overlay, two replicates per sample for each type of media was performed then incubated at 37 ° C for 2 to 7 days with aerobic and anaerobic conditions, to verify any Bacterial or fungal growth. All the microbes were isolated subjected to further identification method [9].

Statistical analysis:- The data were analysed using a statistical program SPSS (version 21), the result optioned by Calculating the Chi secure, frequency, present, P values less than 0.05 was considered significant.

Result:-

Among the 350 students, only 221 participated (106 females and 115 males) with a response rate of (63.1%). The percentage of acne among students was (71.9%), the results showed that gender, skin hygiene, family history and stress condition, statistically significant with acne as follows. The percentage of acne among male 95(43%) was higher compared with female 64(29%). Students who wash their skin 3-5 time 58(26.2%) and more than 5 times 9 (4.1%) in a day less Suffering from acne than those who clean their skin once a day 92(41.6%). The percent of participants who have acne and family history was high , regardless of whether

they are inherited from the father 60 (27.1%), mother 50(22.6%) or both of them 26(11.8%), stress was thought to make acne appear and become worse in 134(60.6%) of students, while there was no significant value between presence of acne and the use of sunscreen, make-up and moisturizing creams (x2=0.532, p=0.466; x2=3.803, p=0.051; x2=3.995,p=0.046), all these variables and values summarized in detail in Table (1).

Table 1: the socio-demographic factors that influence with acne formation.

characteristic	category	Have acne				Total		x	p
		yes		no				13.506	.000
		n.	%	n.	%	n	%		
Gender	male	95	43	20	9	115	52		
	female	64	29	42	19	106	48		
	Total	159	71.9	62	28.1	221	100		
Skin hygiene	1-2	92	41.6	9	4.1	101	45.7	52.168	.000
	3-5	58	26.2	29	13.3	87	39.4		
	>5	9	4.1	24	10.9	33	14.9		
Sun protecting creams	yes	41	18.6	19	8.6	60	27.1	0.532	0.466
	No	118	53.9	43	19.5	161	72.9		
cosmetic	Yes	52	23.5	107	48.4	81	36.7	3.803	.051
	no	29	13.1	33	14.9	140	63.3		
Moisture cream	Yes	27	12.2	132	59.7	45	20.4	3.995	.046
	No	18	8.1	44	19.9	176	79.6		
Family history	Father	60	27.1	10	4.5	70	31.7	58.543	.000
	Mother	50	22.6	9	4.1	59	26.7		
	Both of them	26	11.8	2	0.9	28	12.7		
	None of them	23	10.4	41	18.6	64	29		
stress	yes	134	60.6	25	11.3	167	75.6	23.293	.000
	no	33	14.9	29	13.1	54	24.4		

The highest percentage of females agreed that the appearance of acne increases and becomes worse before the start of the menstrual cycle 77(72.6%) the results were statistically significant, While neither hormonal disorder nor polycystic ovaries had any significant value with acne according to our results that mentioned in Table (2).

Table 2: factors related to female and its association with acne formation.

Variable		Menstrual cycle				Hormonal imbalance				Polycystic ovarian			
		Yes		No		Yes		No		Yes		no	
		No	%	No	%	no	%	no	%	no	%	no	%
Have acne	Yes	55	51.9	9	8.5	8	7.5	56	52.8	7	6.6	57	53.8
	No	22	20.8	20	18.9	40	37.7	2	1.9	2	1.9	40	37.7
Total	Total	77	72.6	29	27.4	96	90.6	9	8.5	9	8.5	97	91.5
X		14.368				1.7				1.245			
P value		.000				0.182				0.265			

The intensity of acne was determined by the global acne grading system (GAGS) and the results were as follows, 136 (61.5%) of participants had mild, 19 (8.6%) of them had moderate and only 5(2.3%) had severe cases, the sever and moderate form were more common among female(2.3%,5%) than male, As mentioned briefly in Table (3).

Table 3: grading acne according to (GAGS), and its distributions with gender.

Gender		Global score					X^2	P
		No lesion	mild	moderate	sever	total	22.992	.000
male	No	20	87	8	0	115		
	%	9	39.4	3.6	0.0	52		
female	No	41	49	11	5	106		
	%	18.6	22.2	5	2.3	48		
Total	No.	61	136	19	5	221		
	%	27.6	61.5	8.6	2.3	100		

Out of 159 samples, only 103 gave positive results, included 44 samples containing mix species of microorganisms and 59 samples containing one species. The type and number of isolates were determined as follows, Propionibacterium acne 15(10.1%), *Staphylococcus epidermidis* 42(28.3%), *Staphylococcus aureus* 40(27%), *Klebsiella SPP.* 14(9.4%), *Streptococcus SPP.* 24(16.2%), *Mallasizia SPP.* 13(8.7%) As mentioned briefly in Table (4).

Table 4: the species of microbe that may be associated with acne formation.

Species	Mix isolates											Total no of mix isolate	Total no of a single isolate	Single isolate No	%	Total no of each isolate
Propionibacterium acnes	+	+	+											3	2.9	15(10.1%)
Staphylococcus epidermidis	+		+	+	+	+	+							16	15.5	42(28.3%)
S.aureus		+	+	+				+	+					15	14.5	40(27%)
Klebsiella				+							+			7	6.7	14(9.4%)
streptococcus						+			+	+	+			10	9.7	24(16.2%)
Mallasizia							+	+		+				8	7.7	13(8.7%)
No.	4	6	2	11	3	5	2	2	4	1	4					
%	3.8	5.8	1.9	10.6	2.9	4.8	1.9	1.9	3.8	0.9	3.8			Total		148
Total												44	59	103		

Discussion:-

Acne is one of the health problems that prevalent among young people, and there are several studies that have dealt with this subject in different parts of the world. But this problem has never been highlighted in the city of Al- Najaf. Therefore, this study was conducted to determine the prevalence of acne in a sample of students and the response rate was less than a study in Syria (99.2%) [10], the prevalence of acne was lower in Saudi Arabia (56.2%), Turkish (40.1%) and Syria (43.7%) than in our study[10, 11, 12], while the result in Singapore was higher (88%) [13]. There is a disparity in the results of studies from different regions of the world on the relationship between gender and acne. A study in Malaysia and turkey reported that acne is more common in males than females [14, 15], and this is consistent with our results, while other studies in Saudi Arabia and Iran showed that acne is more common in females than males[12, 16]. These differences may be due to variation in the proportion of male and female participants. According to U.S. Food and drug administration, the poor hygiene has no interfere with acne [10], which is contrary to our results where there is a significant relationship between acne and a good self-hygiene which consistent with results of a Syrian study [10]. The percentage of acne was higher in a student with a positive family history of acne, according to the study carried out in Cameroon [17] and that corresponds to our results, but the proportion was lower in a study in Japan (56.8%) [18]. There are many researchers who have dealt with the relationship between stress and acne[19, 15]. They reported that stress is one of the risk factors contributing to acne especially among students and this corresponds to our results. It may be due to the relationship between stress and cortisol, where their production increases with increased stress and leads to sebum secretion in larger amounts than the normal secretion rate. The menstrual cycle is regulated by different types of hormones, including progesterone, which its level increase during this period leading to increased production of sebum and close, swell the pores [20]. All these events cause the appearance and exacerbation of acne in females in the pre-menstrual period, Therefore, there are many studies mentioned the existence of a significant relationship between the menstrual cycle and acne (p=0.298, p=0.3)[21,22], however, this is close to the results of our research(p=.000). regarding the acne severity our results were contrary to previous studies in Malaysia and Iran where the severe and moderate cases common among males more than females (P= 0.001, P=0.003)[16,23].The Conflicts of results because the lack of uniform global system for determining severity. In our study, the most prevalent bacterial isolate was *Staphylococcus epidermidis* followed by *S. aureus* while in an Indian study reported that *S.aureus* was the most common isolate[24], furthermore another study showed that *Staphylococcus epidermidis* and *Propionibacterium acnes* were the frequent bacterial cause of acne[25]. The acne may result from overlapping more than one type of microbes act together at the same time.

Conclusion: Acne is more common in males than females, but the sever form was among female. There is a relationship between acne and gender, family history, stress, menstruation, and personal hygiene. It is possible that acne is caused by an overlap of more than one type of microorganisms at the same time; these microorganisms may be bacterial or fungal.

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