

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾
Raghad Yaseen Aiowed⁽³⁾

- 1- Prof. Ph.D. Education for Pure Science, University of Diyala
- 2- Assist.Prof .Ph.D college Science , University of Diyala
- 3-B.Sc Microbiology

Received 28 September 2014 ; Accepted 2 December 2014

Abstract

The aims of the study to assess the immune status of patients infected with molluscum contagiosum through the measurement of the level of immunoglobulin (IgG,IgM) and the level of complement components especially (C3,C4) by radial immune diffusion assay. The present study was conducted on the period from 1 November 2013 to 30 April ,of 2014 in outpatient clinic of Baquba Teaching Hospital . 75 patients were diagnosed with clinical lesions of MCV on different areas of the body, age of patients ranged from (2-50 years) including 40(53.3%) males and 35(46.7%) females .The control were 26.6±15.4 years (range from 2-50 years), 8 (53.3%) of them were males and 7(46.7%) females. After the examination by single radial immune diffusion The results showed the patients were equal or less than 16 years, 24 (32%) from 17-30 years, 19 (25.3%) from 31-45 years and 12 (16%) above 45 years and 40(53.3%) males and 35(46.7%) females, no static significant difference showed between the MCV infection and either the sex or age . The mean±SD of IgM in patients were 1946.6±825.6 mg/dl while in control were 140.1±68.7mg/dl This result is highly significant which indicates that patients with MC had higher level of IgM than control In contrast, patients had lower levels of IgG than control, The mean±SD of IgG in patient were 221.9±96.7mg/dl while in control were 1229.9±299.7mg/dl. This result is highly significant.

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abuldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

Also the patients had lower level of C3 and C4 than control. The mean±SD of C3 in patients were 109.6±64.8mg/dl while in control were 120.8±22.1mg/dl. The mean±SD of C4 in patients were 27.8±12.7mg/dl while in control were 38.7±9.8mg/dl. These results are statistically significant . Forty seven (62.7%) patients were from rural area while 28 (37.7%) from urban. There is no statistical difference between both groups .

Key words: Molluscum Contagiosum , Immunoglobulins, Complement Components

دراسة بعض المؤشرات المناعية لدى بعض المرضى المصابين بفيروس المليساء المعديّة

عباس عبود فرحان⁽¹⁾ محمد عبد الدايم صالح⁽²⁾ رغد ياسين اعويد⁽³⁾

1- كلية التربية للعلوم الصرفة / جامعة ديالى

2- كلية العلوم / جامعة ديالى

3- بكالوريوس علوم الحياة

الخلاصة

هدفت الدراسة الى تقييم الحالة المناعية للمرضى المصابين بفيروس المليساء المعدي من خلال استخدام العوامل او المؤشرات المناعية. والتي تتضمن قياس مستوى الغلوبولينات المناعية (IgG, IgM) وكذلك قياس فعالية المتمم وبالتحديد العامل الثالث والرابع من خلال استخدام فحص الانتشار المناعي المفرد. أجريت الدراسة الحالية للفترة من 1 تشرين الثاني 2013 لغاية 30 نيسان 2014 في العيادة الاستشارية لمستشفى بعقوبة التعليمي. شخّصت الإصابة في (75) مريض بفيروس المليساء المعدي في مناطق مختلفة من الجسم، تراوحت أعمار المرضى بين (2-50 سنة)، تضمنت 40 (53.3%) مريض من الذكور و35 (46.7%) من الإناث. وقد أخذت (15) عينة من الأصحاء حيث كان معدل أعمارهم بين (2-50 سنة)، 8 (53.3%) من الذكور و 7 (46.7%) من الإناث. بعد إجراء فحص الانتشار المناعي المفرد، وجد إن المرضى الذين تكون أعمارهم مساوية أو اقل من 16 سنة كان عددهم 24 (32%) من 17-30 سنة، 19 (25.3%) من 31-45 سنة، 12 (16%) فوق 45 سنة و كان الجنس 40 (53.3%) ذكور و 35 (46.7%) إناث، ولا يوجد فرق إحصائي معنوي بين الإصابة بالفيروس بالمقارنة مع كل من الجنس والعمر. بينت النتائج بأن. وبينت النتائج ان مستوى الامينوغلوبيولين (IgM) في المرضى كانت (1946.6±825.6) ملغم / ديسيلتر بينما في الأصحاء كانت (140.1±68.7) ملغم / ديسيلتر يعني وجود فرق إحصائي معنوي حيث وجد ارتفاع في مستوى الامينوغلوبيولين (IgM) للمرضى بالمقارنة مع الأصحاء وبالعكس بينت النتائج انخفاض في مستوى الامينوغلوبيولين (IgG) حيث وجد إن مستوى

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abuldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

(IgG) في المرضى كانت (221.9±69.7) ملغم / ديسيلتر بينما في الأصحاء كانت (1229.9±299) ملغم / ديسيلتر. كما بينت النتائج انخفاض مستوى العامل المتمم الثالث والرابع في المرضى بالمقارنة مع الأصحاء، حيث وجد ان مستوى العامل المتمم الثالث في المرضى كان (109.6±64) ملغم / ديسيلتر بينما في الأصحاء كانت، (120.8±22) ملغم / ديسيلتر، بينما وجد ان مستوى العامل المتمم الرابع في المرضى كان (27.8±12.7) ملغم / ديسيلتر بينما في الأصحاء كانت (38.7±9.8) ملغم / ديسيلتر. وجد سبع واربعين من المرضى (62.7%) كان من الريف بينما (37.7%) (37.7%) من المدينة، ولا وجود فرق احصائي معنوي بين الحالتين.

الكلمات المفتاحية: داء المليساء المعدي، الامينو غلوبولينات، مجموعة المتممات

Introduction

Molluscum Contagiosum Virus was first described and later was named by Bateman in the early nineteenth century(1). There are various types of *Molluscum Contagiosum Virus*, and they are most commonly seen in humans, but have been found to be in animals such as chickens, horses, oxen, cows. (2).*Molluscum contagiosum* is caused by up to four closely related types of poxvirus, MCV1 to 4 and their variants. Although the proportion of infection caused by the various types varies geographically, throughout the world MCV1 infections are most common. In small children virtually all infections are caused by MCV1. There is no difference in the anatomic region of isolation with regard to infecting type (as opposed to HSV, for example). In patients infected with HIV, however MCV2 causes the majority of infections (60%), suggesting that HIV infection associated molluscum does not represent recrudescence of childhood molluscum (3). The key event in an adaptive immune response is antigen presentation, yielding either a cell-mediated or a humeral response. The cellular response involves primarily T cells , whereas the humoral response involves B cells that ultimately mature into antibody-secreting plasma cells (4). Humeral immunity plays an important role in the body's defense against molluscum infection. Most adults are resistant to MCV infection because they have developed immunoglobulin G antibodies against the viral antigen. However, patients with impaired cellular immunity, such as in AIDS or post-transplant immunosuppression, are more likely to develop widespread infections that are difficult to treat. It has been reported that up to 24.2 percent of patients with molluscum have

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

a concomitant diagnosis of atopic dermatitis, and these children also experience more difficulty in clearance. (5). While it is true that immunosuppressed patients are more likely to develop more severe MCV infections, recent data have shown that contrary to common belief. The prevalence of immunosuppression among children with molluscum contagiosum is low. In a cross-sectional study of three tertiary referral centers, no cases of HIV infection were noted among 302 children with molluscum. The fact that immunosuppression is rare in the population of children infected with MCV suggests that HIV infection has less impact on the overall epidemiology of molluscum contagiosum than was previously thought (5). The aims of the study to assess the immune status of patients infected with molluscum contagiosum through the measurement of the level of immunoglobulin (IgG, IgM) and the level of complement components especially (C3, C4) by radial immune diffusion assay.

Material and Methods

Radial Immune Diffusion Test

C3RID Test

Procedure

Remove the plate from its envelope and leave to stand at room temperature for few minutes so that any condensed water in the wells can evaporate. Fill the wells with 5 μ L of sample and/or controls and waited it has been completely adsorbing before handling the plate. Close the plate and place it in a moist chamber for 72 hours.

Reading 18 hours (Kinetic Method)

The results read after 18 hours of the sample deposition, although the growth of the zones is not yet complete. In this case it is necessary to deposit at least 3 controls with different values. Curve that plots the square of the precipitating ring and the logarithm of the concentration of the controls. The interpolating curve get that can be approximated to a straight line only for low values while for higher values may be bent slightly. The values of the samples are determined by interpolation.

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abuldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

C4 RID Test

Procedure

Remove the plate from its envelope and leave to stand at room temperature for few minutes so that any condensed water in the wells can evaporate. Fill the wells with 5 μ L of sample and/or controls and wait it has been completely adsorbing before handling the plate. Close the plate and place it in a moist chamber for 72 hours.

READING 18 HOURS (KINETIC METHOD)

The results read after 18 hours of the sample deposition, although the growth of the zones is not yet complete. In this case it is necessary to deposit at least 3 controls with different values. Curve that plots the square of the precipitating ring and the logarithm of the concentration of the controls. The interpolating curve get that can be approximated to a straight line only for low values while for higher values may be bent slightly. The values of the samples are determined by interpolation.

IgG RID Test

Procedure

Remove the plate from its envelope and leave to stand at room temperature for few minutes so that any condensed water in the wells can evaporate. Fill the wells with 5ml of sample and/or controls and wait it has been completely adsorbing before handling the plate. Close the plate and place it in a moist chamber for 48 hours.

Reading 18 hours (Kinetic Method)

The results read after 18 hours of the sample deposition, although the growth of the zones is not yet complete. In this case it is necessary to deposit at least 3 controls with different values. Curve that plots the square of the precipitating ring and the logarithm of the concentration of the controls. The interpolating curve get that can be approximated to a

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

straight line only for low values while for higher values may be bent slightly. The values of the samples are determined by interpolation.

IgM RID Test

Procedure

Remove the plate from its envelope and leave to stand at room temperature for few minutes so that any condensed water in the wells can evaporate. Fill the wells with 5 μ L of sample and/or controls and wait it has been completely adsorbing before handling the plate. Close the plate and place it in a moist chamber for 72 hours.

Reading 18hours (Kinetic Method)

The results read after 18 hours of the sample deposition, although the growth of the zones is not yet complete. In this case it is necessary to deposit at least 3 controls with different values. Curve that plots the square of the precipitating ring and the logarithm of the concentration of the controls. The interpolating curve get that can be approximated to a straight line only for low values while for higher values may be bent slightly. The values of the samples are determined by interpolation.

Results

Demographic data

Descriptive statistics of age in both groups:

The mean ages \pm SD of patients in *patients* were 26.92 \pm 16.1 years (range from 2-50 years), 40 (53.3%) patients were males and 35 (46.7%) females with male to female ratio 1:1.14. Twenty (26.7%) of *patients* were equal or less than 16 years, 24 (32%) from 17-30 years, 19 (25.3%) from 31-45 years and 12 (16%) above 45 years. **(Table-1)**

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

Table -1: Descriptive statistics of age in both groups.

	No.	Minimum	Maximum	Mean	SD
patients	75	2	50	26.92	16.105
controls	15	2	50	26.60	15.403

4.1.b. Distribution of age in both groups

.The mean ages \pm SD of *controls* were 26.6 \pm 15.4 years (range from 2-50 years), 8 (53.3%) of them were males and 7 (46.7%) females with female to male ratio 1:1.14. Four (26.7%) of *controls* were equal or less than 16 years, 5 (33.3%) from 17-30 years, 3 (20%) from 31-45 years and 3 (20%) above 45 years. Both groups were statistically matched regarding gender and age with p value equal to 1.0 and 0.965 respectively. (Table -1, Table-2).

Table -2: Distribution of age in both groups.

Age Group	patients		controls		P value
	No.	%	No.	%	
≤ 16 years	20	26.7	4	26.7	0.965
17-30 years	24	32.0	5	33.3	
31-45 years	19	25.3	3	20.0	
> 45 years	12	16.0	3	20.0	
Total	75	100.0	15	100.0	

**Study of Some immunological parameters in Patients with
*Molluscum Contagiosum***

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

Residence of studied subjects in both groups

Forty seven (62.7%) *patients* were from rural area while 28 (37.7%) from urban. There is no statistical difference between both groups as p value equal to 0.567. (Table -3)

Table -3: Residence of studied subjects in both groups.

Residence	patients		controls		P value
	No.	%	No.	%	
Rural	47	62.7	8	53.3	0.567
Urban	28	37.3	7	46.7	
Total	75	100.0	15	100.0	

Immunologic study:-

The mean±SD of IgM (normal level 60-280 mg/dL) in patients were 1946.6±825.6 mg/dl while in controls were 140.1±68.7mg/dl. All patients had high IgM level and all controls had normal values. This result is highly significant which indicates that patient with MC had higher level of IgM than control (p value= 0.0001). (Table -4, Table -5) In contrast, patients had lower levels of IgG (normal level 800-1800 mg/dL) than controls. The mean±SD of IgG in patients were 221.9±96.7 while in controls were 1229.9±299.7. All patients had low IgG level and all controls had normal values. This result is highly significant (p value= 0.0001). (Table -4, Table -5)

Also the patients had lower level of C3 (normal level 91-256 mg/dL) and C4 (normal level 20-50 mg/dL) than controls. The mean±SD of C3 in patients were 109.6±64.8 while in controls were 120.8±22.1. All subjects in controls had normal C3 levels while 54.7% of patients had low C3 levels. These results are statistically significant (p value= 0.005). (Table -4, Table -5)

The mean±SD of C4 in patients were 27.8±12.7 while in controls were 38.7±9.8. All subjects in controls had normal C4 levels while 38.7% of patients had low C4 levels. These results are statistically significant (p value= 0.0001). (Table -4, Table -5)

**Study of Some immunological parameters in Patients with
*Molluscum Contagiosum***

Abbas About Farhan⁽¹⁾ Mohammed abuldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

Table -4: Levels of, IgM, IgG, C3 and C4 in both groups.

		Min.	Max.	Mean	SD	Total No.
IgM	patients	773.4	2913.6	1946.6	825.6	75
	controls	80.1	275.4	140.1	68.7	15
IgG	patients	57.7	388.9	221.9	96.7	75
	controls	810.4	1777.7	1229.9	299.7	15
C3	patients	40.1	271.3	109.6	64.8	75
	controls	92.9	151.1	120.8	22.1	15
C4	patients	14.0	52.5	27.8	12.7	75
	controls	20.3	49.4	38.7	9.8	15

Table -5::Values of, IgM, IgG, C3 and C4 in both groups

		patients		controls		P value
		No	%	No	%	
IgG	Low	75	100.0%	0	0.0%	0.0001
	Normal	0	0.0%	15	100.0%	
IgM	Normal	0	0.0%	15	100.0%	0.0001
	High	75	100.0%	0	0.0%	
C3	Low	41	54.7%	0	0.0%	0.0001
	Normal	24	32.0%	15	100.0%	
C4	High	10	13.3%	0	0.0%	0.005
	Low	29	38.7%	0	0.0%	
C4	Normal	42	56.0%	15	100.0%	0.005
	High	4	5.3%	0	0.0%	

Values of IgM, IgG, C3 and C4 regarding gender in patients:-

The gender had no statistical relationship to the level of IgM, IgG, C3, while it has positive for C4 level as 65.5% of those with low C4 were males and 100% of those with high C4 were females (p value 0.039). (Table-6)

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaime saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

Table -6:: Values of IgM, IgG, C3 and C4 regarding gender in patients

		Male		Female		Total		P value
		No	%	No	%	No	%	
IgM	High	40	53.3%	35	46.7%	75	100.0%	-
	Low	40	53.3%	35	46.7%	75	100.0%	-
C3	Low	24	58.5%	17	41.5%	41	100.0%	#0.597
	Normal	11	45.8%	13	54.2%	24	100.0%	
	High	5	50.0%	5	50.0%	10	100.0%	
C4	Low	19	65.5%	10	34.5%	29	100.0%	*0.039
	Normal	21	50.0%	21	50.0%	42	100.0%	
	High	0	0.0%	4	100.0%	4	100.0%	

#pvalue calculated by Pearson Chi square. *pvalue calculated by Fisher exact test

Discussion

The present study revealed that most of patients were found in ages ranging between (17-30) years. This result might agreement with the study done by (6) ,who reported that most of patients belonged to ages ranging between (11- 30) years, While disagreement with the study done by (7) were the range between (31-40) years. (Table- 2) This difference in results may be due to the difference in social living levels. The present study showed that male to female ratio was 1:1.14. This result in contrast to most studies in the world, Where in study done by (8)the male to female ratio was 1:6.1, the same result of 1:1.6 was obtained from study done by (9). The another study reported by (10) male to female ratio was 1:4.2.

(Table-7) This is the first study in which IgG, IgM, C3, C4 were investigated in patients with mulloscum contagiosum This study showed that all patients with MC had low levels of IgG and high levels of IgM and this indicates an acute infections (11) and this results were inconsistent with many reports (12;13;14). Because these previous reports had low sample size and association of immunodeficiency status with mulloscum contagiosum, the results of the present study were more accruable and dependable. All female patients in this study with MC had high levels of C4 while 65.5% of males had low levels of C4. This relationship need to be proved by further studies with higher sample size.C3 plays a central role in the activation of complement system. Its activation is required for both classical and alternative

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abduldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

complement activation pathways. People with C3 & C4 deficiency are susceptible to infection. Complement components (C3 & C4) were low in patients with mulloscum contagiosum. These results were consistent with other reports (14;15;16).

Conclusions and Recommendations

Conclusions

1. The most of patients were found in ages ranging between (17-30) years.
2. All patients with MC had low levels of IgG and high levels of IgM and this indicates an acute infections.
3. Complement components (C3 & C4) were low in patients with mulloscum contagiosum.

Recommendations

1. A future study to determine the prevalence of differentmolecular types of MCV in different sectors of Diyala province.
2. More studies to determine the other interleukines against MCV in patients infected by MCV.
3. More studies to determine the cellular immune response against MCV in patients infected by MCV.
4. More studies to determine atopic dermatitis associated with molluscum contagiosum.

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan⁽¹⁾ Mohammed abuldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

References

1. Bateman F.(1953).MolluscumContagiosum In : Shelley WB, Crissey JT, the poxviruses that can zoonotically infect man, which indicates which of these infections are clinically important. springfield (il); p. 20.
2. Billstein SA. Mattaliano VJ.(1990).The "Nuisance" Sexually Transmitted Diseases: MolluscumContagiosum, Scabies, And Crab Lice. Med Clin North Am; 74: 1487-1505
3. William D J, Timothy G B, Dirk ME ,(2012). Andrews' Diseases of The skin clinical Dermatology . 11
4. Jean L .Bolongia MD, Joseph L,Jorizzo ,Julie V .Schaffer,(2012). Dermatology.
5. Dohil MA, Lin P, Lee J, et al(2006). The epidemiology of molluscumcontagiosum in children. J AmAcad Dermatol;54:47-54.
6. Kuchabal D.S. Kuchabal, B. Siddaramappa, P.S.M. Katti& P.V. Patil(2011).Molluscum Contagiosum a clinical and epidemiological study.Internet Journal Of Dermatology. Volume 8 Number 2.
7. Chandrshekar L, Devinder M, and Telanseri J,(2002). Clinical profile ofmolluscum contagiosum in children versus adults Dermatology online Journal 9 (5): 1
8. Skuchabal .D .Kuchabal B. Siddaramappap .Katti P. patil (2010) .Molluscum contagiosum Aclinical And Epidemiological study .The internet Journal of Dermatology 8(2).
9. Laxmisha C¹, Thappa DM, Jaisankar TJ.(2003). Clinical profile of molluscum contagiosum in children versus adults. Dermatol Online J. 2003 Dec;9(5):1
10. Fayemiwo OA Adesina, JO Akinyemi, GN Odaibo, TO Omikunle, IF Adewole (2014) .Molluscumcontagiosum virus infection amongst plwhain ibadan, Nigeri .Journal home.15(1):8-1
11. Sheila C. D, Stephanie A. S. , and Michael J. C(2011). National Prevalence Estimates for Cytomegalovirus IgM and IgG Avidity and Association between High IgM Antibody Titer and Low IgG Avidity. Clin Vaccine Immunol.; 18: 1895–1899.
12. Mayumi M, Yamaoka K, Tsutsui T, Mizue H, Doi A, Matsuyama M, Ito S, Shinomiya K, Mikawa H(1986) . Selective immunoglobulin M deficiency associated with disseminated molluscumcontagiosum. Eur J Pediatr. Apr;145(1-2):99-103.

Study of Some immunological parameters in Patients with
Molluscum Contagiosum

Abbas Aboud Farhan ⁽¹⁾ Mohammed abuldaim saleh⁽²⁾ Raghad Yaseen Aiowed⁽³⁾

13. Sara SebnemKilic, FatihKilicbay (2006). Interferon- Treatment of Molluscum Contagiosum in a Patient With Hyperimmunoglobulin E Syndrome. Pediatrics;117;e1253
14. Vozmediano JM, Manrique A, Petraglia S, Romero MA, Nieto I(1996). Giant molluscumcontagiosum in AIDS.Int J Dermatol. Jan;35(1):45-7.
15. Untoo RA, Shaheen N, Lone IA, Sheikh S(2009). Fulminant Ocular Molluscum Contagiosum. Indian Journal for the Practising Doctor .; 5
16. Matsuyama W, Nakagawa M, Takashima H, Muranaga F, Sano Y, Osame M (December 2001). "Molecular analysis of hereditary deficiency of the third component of complement (C3) in two sisters". Intern. Med. 40 (12): 1254–8.

