

Identification of the type of Human Papilloma Virus (HPV) in condyloma acuminata in the genital and/or anal areas in men who have sex with men (MSM)

Boy Ardi Rohanda^{1*}, Richard Hutapea², Kristina Nadeak²

ABSTRACT

Background: Condyloma acuminata is a sexually transmitted infection (STI) caused by the Human Papilloma Virus (HPV), marked by mucosal and skin hyperplasia, especially in the anogenital areas. HPV is transmitted by sexual intercourse. The incidence of condyloma acuminata in men who sex with men (MSM) increases due to the variations in genito-anal sexual intercourse. This study determined the type of HPV in condyloma acuminata in the genital and/or anal area in MSM.

Methods: This study was a descriptive observational study with a cross sectional approach in 25 MSM subjects with condyloma acuminata at the Dermatology and Venereology outpatient clinic of Haji Adam Malik General Hospital Medan and Universitas Sumatera Utara Hospital from June 2020 to February 2021. Subjects were selected by consecutive sampling. The samples of condyloma acuminata were collected by a shave biopsy technique, followed by examining the DNA type of HPV using the PCR method. We collected the demographic data (age, education level, employment, condyloma acuminata location, and condyloma acuminata lesion shaped) and then presented it in the descriptive.

Results: From 25 men who had condyloma acuminata in this study, most of them (14 people or 56%) were 19-26 years old and unmarried with homosexual orientation. Fifteen people (60%) graduated from high school, and 21 respondents (84%) worked as employees. The most locations of condyloma acuminata on the anal area as many as 16 people (64%), the most common characteristic of the lesion was acuminatum, found in 16 people (64%), and the most common type of HPV was HPV type 11 in 13 people (52%). In the genital areas and anal areas, the most common type of HPV was HPV type 11 in 4 people (44,4%) and nine people (56,2%). The most characteristic lesions in the genital area were papule in 7 people (77,8%), and in the anal area were acuminatum in 14 people (87,5%).

Conclusion: The most common type of HPV in condyloma acuminata in the genital area and anal area in MSM were HPV type 11. The characteristic of condyloma acuminata lesions in the genital area in MSM was mostly papule, whereas in the anal area was acuminatum.

Keywords: Condyloma acuminata, genital area, anal area, MSM, HPV type.

Cite This Article: Rohanda, B.A., Hutapea, R., Nadeak, K. 2021. Identification of the type of Human Papilloma Virus (HPV) in condyloma acuminata in the genital and/or anal areas in men who have sex with men (MSM). *Bali Medical Journal* 10(2): 885-890. DOI: 10.15562/bmj.v10i2.2439

¹Postgraduate Master of Clinical Medicine, Department of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Universitas Sumatera Utara Hospital, Medan, Indonesia;

²Department of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Universitas Sumatera Utara Hospital, Medan, Indonesia;

*Corresponding author:

Boy Ardi Rohanda;
Postgraduate Master of Clinical Medicine Department of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Universitas Sumatera Utara Hospital, Medan, Indonesia;

boyardirohanda@gmail.com

Received: 2021-05-02

Accepted: 2021-06-30

Published: 2021-07-30

INTRODUCTION

Condyloma acuminata is a sexually transmitted infection (STI) caused by the Human Papilloma Virus (HPV), characterized by mucosal changes and skin hyperplasia, especially in the anogenital area.¹ HPV is transmitted through sexual contact, both genito-genital, oro-genital and genito-anal. The thinner mucosal surface is more susceptible to viral inoculation than thicker keratinized skin. So, micro abrasion of the epithelial surface

allows the virions of the infected partner to enter the basal cell layer of the uninfected partner. Basal cells are the first site of HPV infection. After inoculation through minor trauma, the HPV virions will enter into the basal epithelial cell layer.²

The prevalence of condyloma acuminata is estimated to be 1% in the sexually active population. The prevalence is increasing in European countries. From 1996-2005, the prevalence of condyloma acuminata increased by about 25% in the

UK. In 2008, surveillance data for the total number of condyloma acuminata cases were 2,276 in Hong Kong.³ Data reported by the Indonesian Sexually Transmitted Infection Study Group from 13 Dermato-Venereology education center hospitals in Indonesia, including Medan, Padang, Palembang, Jakarta, Bandung, Semarang, Yogyakarta, Malang, Surabaya, Denpasar, and Manado between 2007 to 2011. The result indicated an increasing trend in the proportion of anogenital condyloma

acuminata in the last five years, namely 2007 (21.25%), 2008 (33.81%), 2009 (33.66%), 2010 (29.25%) and 2011 (30.58%).^{4,5,6}

Most condyloma acuminata cases can be diagnosed based on history and clinical examination. If necessary, supporting investigations such as acetic acid test, cytology or histopathology, colposcopy, histochemical examination, HPV antigen detection and HPV deoxyribonucleic acid (DNA) detection can be performed.^{7,8,9} Currently, polymerase chain reaction (PCR) is the most sensitive technique to detect HPV.¹⁰ Research conducted by Rucitra on condyloma acuminata identified through PCR reported the types of HPV associated with condyloma were divided into 2 types of risk levels, namely low risk (types 6, 11, 42, 43, 44 and 81) and high risk (types 16, 18, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59 and 66). The most common types of anogenital condyloma acuminata were HPV type 18 (28.5%), types 6 and 11 (14.3%).⁷

The incidence of condyloma acuminata in the perianal area tends to increase due to variations in genito-anal sexual intercourse, especially in men who have sex with men (MSM).¹¹ Risk factors for transmission are closely related to sexual behavior.¹² The high incidence of condyloma acuminata in homosexual patients is closely related to genito-anal sexual behavior, which is more at risk of contracting the disease.¹³ In males, the most lesions were in the anal area (54.1%), while most lesions in women were found in the genital area (71, 4%). The difference in the location of these lesions is thought to be due to sexual intercourse. In women, it is genito-genital so that condyloma acuminata lesions are not found in the anal area.⁷ The purpose of this study was to determine the type of HPV in condyloma acuminata in the genital and/or anal area in MSM.

METHODS

This study was conducted after approval from the Ethics Commission in the Faculty of Medicine, Universitas Sumatera Utara/Haji Adam Malik General Hospital, with letter number 6821/KEP/USU/2020. MSM subjects with condyloma acuminata at the Dermatology and Venereology outpatient

clinic of Haji Adam Malik General Hospital Medan and Universitas Sumatera Utara Hospital from June 2020 to February 2021. Subjects were selected by consecutive sampling. Inclusion criteria: men who have sex with men; those diagnosed with condyloma acuminata based on anamnesis and clinical examination with the location of the lesions on the genitals and/or anal; and those aged over 18 years. Exclusion criteria were a history of coagulation disorders and sexual intercourse with women. The condyloma acuminata samples were collected by a shave biopsy technique, followed by examining the PCR method using HPV XpressMatrix Genotyping Kit based on the use of target amplification and hybridization methods for the detection of the following 21 HPV genotypes (6 low risk: type 6, 11, 42, 43, 44, 81 and 15 high risk: 16, 18, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 68). We also collected demographic data like age, education level, condyloma acuminata location, and condyloma acuminata lesion shaped. The research data were analyzed statistically using a computer device. The collected data is then tabulated and then presented in the form of descriptive data.

RESULTS

The demographic characteristics of condyloma acuminata of MSM patients in this study were highest in the age range of 19-26 years (56%). Most of the patients were senior high school education level (60%) and private employees (84%). The HPV characteristics based on lesion location, lesion shaped, and virus type were determined. This study found that condyloma acuminata in the anal area were counted 16 people (64%). Based on the characteristics of the lesions, the most lesions characteristic found were acuminata-shaped lesions (64%). Types of HPV examined in this study were low-risk HPV types: 6, 11, 42, 43, 44, 81 and high-risk HPV types: 16, 18, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 68. The most HPV types were type 11 (52%) and type 6 (24%) (Table 1).

This study found that in the genital area, the type of HPV that caused most of the condyloma acuminata was type 11 (44.4%). At the same time, other types that cause condyloma acuminata in the genitals

are HPV type 6 (22.2%) and HPV type 16 (11.1%). In patients with condyloma acuminata genital area, there were also multiple HPV types, accounting for 11.1% respectively for type 6 and 11 and type 11 and 16 (Table 2).

In the genital area condyloma acuminata, the characteristics of the most lesions were the papule form (77.8%) and the acuminata form (22.2%). There is no giant condyloma acuminata at the genital location. In this study, it was known that in the anal area, the most characteristic lesions were acuminata (87.5%). There were two people (12.5%) of the anal site condyloma acuminata (Table 3).

DISCUSSION

The age group of condyloma acuminata subjects was highest at 19-26 years. This result is in line with research conducted by Jeo in 2018 at Cipto Mangunkusumo Hospital (RSCM) that the reproductive age of 20-39 years is a risk factor for the occurrence of condyloma acuminata.¹⁴ The high incidence of condyloma acuminata at more than or equal to 25 years is thought to be due to the peak period of sexual activity.⁷ Lin et al. explained that most condyloma acuminata was found in 18-30 years as many as 21 people.³ A study conducted by Wilvestra et al. states that genital warts occur in sexually active adults aged 18-25 years.⁴ According to the AIDS Commission, it is essential to pay attention to age distribution because the younger a person is, the more vulnerable he is to contract sexually transmitted diseases. Men in the age group of 20-34 years and women 16-24 years are at high risk of contracting sexually transmitted diseases.⁶

In this study, all study subjects were unmarried men whose sexual orientation was homosexual. This result followed the study conducted by Jeo, which obtained results from 48 patients with condyloma acuminata, 25 patients who were unmarried and 23 patients who were married.¹⁴ Marital status affects the pattern of spread of sexually transmitted infections in general, as well as cases of condyloma acuminata, especially in someone who tends to change partners and have unsafe sexual activity.^{15,16} High incidence of condyloma acuminata in

Table 1. The demographic characteristics of condyloma acuminata of MSM patients

Variables	N (n=25)	Percentage (%)
Age		
19 – 26 years old	14	56
27 – 34 years old	11	44
Education level		
Elementary School	0	0
Junior High School	2	8
Senior High School	15	60
Diploma/Bachelor	8	32
Employment		
Private employees	21	84
Unemployment/Students	4	16
Condyloma acuminata location		
Genital	9	36
Anal	16	64
Condyloma acuminata lesion shaped		
Acuminata	16	64
Papule	7	28
Flat	0	0
Giant	2	8
HPV types		
Type 6	6	24
Type 11	13	52
Type 42	0	0
Type 43	0	0
Type 44	0	0
Type 81	0	0
Type 16	2	8
Type 18	0	0
Type 31	0	0
Type 33	0	0
Type 35	0	0
Type 39	0	0
Type 45	0	0
Type 51	0	0
Type 52	0	0
Type 53	0	0
Type 56	0	0
Type 58	0	0
Type 59	0	0
Type 66	0	0
Type 68	0	0
Type 6 and 11	1	4
Type 11 and 16	3	12

homosexuals is associated with genito-anal sexual behavior, which is more at risk of contracting the disease.⁷ This can also be caused by unprotected anal intercourse. In addition, the MSM group tends to have multiple sexual partners, either male partners are permanent or not permanent. MSM also uses the internet to find

partners and carries out sexual relations with unknown partners.²

Based on the results of this study, the education levels of the patients who completed junior high school education was two people (8%), senior high schools were 15 patients (60%), and tertiary institutions or diplomas were eight people

(32%). This result was in line with the research conducted by Wahyuni, which found that most of the sample were educated at elementary school (46%), junior high school (30.7%) and senior high school or university (23.3%).¹⁷ Wilvestra et al. stated that the education level of condyloma acuminata patients is distributed in Junior High School 1 person (8.3%), Senior High School 7 people (58.3%), and Higher Education 4 people (33.3%).⁴ Research by Rucitra found a low level of education (uneducated, elementary school) not found, secondary education (junior and senior high school) as many as 40 people (61.5%), higher education (Diploma, Bachelor) as many as 25 people (38.5%).⁷ Research conducted by Effendi et al. found 66 people (81.5%) also received a low level of education and 15 people (18.5%) of higher education.¹⁸ Based on this research result, it was found that 21 people (84%) of the research subjects worked, generally, as private employees, and four people (16%) who did not work were still students. Saputra also found the same result where most of those who suffer from condyloma acuminata work privately.¹⁶

This study found that condyloma acuminata in the anal area was 64%, while the genital area was 36%. This data in line with Rucitra's study where 34 patients (45.4%) had condyloma acuminata in the anal area and 28 patients (37.3%) had condyloma acuminata in the genital area.⁷ Sitepu also received the distribution of study subjects based on the location of the most lesions in perianal and/or anal as many as 21 people (53.8%), followed by genital and perianal or genital and anal as many as 11 people (28.2%) acuminata are in the anal and perianal areas.⁶ This data illustrates that nowadays, anogenital sexual intercourse is increasingly being performed, especially among homosexual men.¹⁹ The thin mucosal surface is more susceptible to viral inoculation than thick, keratinized skin. The lesions were more common in areas that experienced friction due to coitus.²⁰ In contrast to the results of Giuliano's study, HPV infection in the genital area was detected in 73% of men.²¹

The most characteristic lesions were acuminata-shaped lesions (64%), papule-shaped lesions (28%), and giant

Table 2. Overview of HPV type characteristics according to the lesion location of research subjects.

HPV types	Lesion Location			
	Genital		Anal	
	(n)	%	(n)	%
6	2	22,2	4	25
11	4	44,4	9	56,2
16	1	11,1	1	6,2
6 and 11	1	11,1	0	0
11 and 16	1	11,1	2	12,5
Total	9	100	16	100

Table 3. Condyloma acuminata lesion shaped according to lesion location

Lesion Characteristics	Location			
	Genital		Anal	
	(n)	%	(n)	%
Acuminata	2	22,2	14	87,5
Papule	7	77,8	0	0
Flat	0	0	0	0
Giant	0	0	2	12,5
Total	9	100	16	100

lesions (8%). This result was in line with Sulistyaningrum's research which found that the clinical form of condyloma acuminata was found to have a classic form, namely the acuminata form.¹⁹ But this is different from the research conducted by Sitepu, which got the results of the most common form of lesions found in Condyloma acuminata patients was the giant form in 15 patients (38.5%), due to the prolonged manifestation and difficult clearance of the virus, the infection became persistent. This condition causes the lesion progression to be longer, easier to recur, and bigger.⁶

Based on data presented in this study, it was found that the most types of HPV in the study subjects were type 11 (52%) and type 6 (24%). In addition, there were also multiple HPV types, namely, types 6 and 11 (4%) and types 11 and 16 (12%). Cong's research found that HPV infection types 6 and 11 were the most common causes of condyloma acuminata.²² Wilvestra et al. also found that the most HPV types in condyloma acuminata patients were type 6.⁴ Research conducted

by Sulistyaningrum also stated that in the lesions, HPV types 6 and 11 were found, with details of HPV type 6 as much as 17.5% of patients and HPV type 11 by 30% of patients. The finding of multiple HPV types is often associated with infections that tend to be persistent.¹⁹ The results of Che's study also found that infection with multiple subtypes was associated with the persistence of infection.²³ Persistence was defined as the same type detected, at least on two tests within one year. Persistent HPV infection is associated with clinical manifestations. Risk factors for the incidence of multiple HPV infections are HIV infection, multiple sexual partners, and men with sex with men (MSM).¹⁹ Hidayat obtained anogenital condyloma acuminata lesion with HPV type 6 (90%) and HPV type 6 with multiple HPV types (10%).⁴ Woodman stated that simultaneous coinfection with HPV 16 and other subtypes resulted in a longer duration of HPV 16 positivity than HPV 16 infection alone. Meanwhile, HPV 6 and/or 11 constitute the majority of anogenital condyloma acuminata (70-100%).²⁴

Research conducted by Leung found that about 90% of the condyloma acuminata in the genital area were caused by low-risk HPV, namely HPV type 6 and/or HPV type 11.²⁵ In the study conducted by Flores-Diaz, it was found that the variant that caused the most genital acuminata condyloma was HPV type 6 and 11.²⁶ The results of the study conducted by Kofoed also found that HPV type 6 was the most detected condyloma acuminata in genital location and type 16 was rare, namely only 2.7% of all patients in the study.²⁷

This study showed that condyloma acuminata in the anal area was caused mainly by HPV type 11. Giuliano found that HPV type 6 and HPV type 11 were the most detectable in condyloma acuminata at the anal location.²¹ The Leszczyszyn study stated that most (90%) two HPV subtypes caused condyloma in the anal area at low risk 6 and 11, as well as combinations with types 16, 18, 31, 33 and 35.²⁸

A previous study found condyloma acuminata in the genitals primarily found in papule-shaped lesions in 33 patients (84.62%).²⁹ In Ali's study, the results were also found in the genital location. Most condyloma acuminata were in the form of papules in 27 patients (73.3%).²⁰ Research conducted by Leung found that condyloma acuminata in the genital area are usually small, soft, smooth, like jewels and papules.²⁵ Papule-shaped lesions are usually found in areas with complete keratinization. that is, the shaft of the penis and the perianal.^{30,31}

This study was in line with research conducted by Hastuti that giant condyloma acuminata is a rare sexually transmitted infection with an incidence in the general population of around 0.1%.³² Other studies obtained results from his research that condyloma acuminata in the anal location were mainly shaped like cauliflower, which was included in acuminata.³³ The form of acuminata is soft because it does not have keratin, especially in mucosal areas that are warm, moist, and hairless.^{30,31}

Giant condyloma acuminata often covers multiple anatomical structures due to their large size, and most commonly affecting the penis and anorectal.³⁴ Condyloma acuminata with anorectal lesions usually affects HIV-infected homosexual men.⁶ The thinner mucosal

surface is a more susceptible area to inoculation virus rather than thicker keratinized skin.² Giant development occurs in a decrease in cellular immunity status, leading to increased susceptibility to HPV. The state of immunosuppression due to HIV/AIDS infection is a risk factor for giant condyloma.³⁵ The number of samples in this study is limited so that further research is needed and the different sexual orientations.

CONCLUSION

The highest incidence of condyloma acuminata based on subject characteristics was in the age group 19-26 years, high school education level, and private employees. The most common type of HPV in condyloma acuminata in the genital area and in the anal area were HPV type 11. Papule form was the most clinical lesion in the genital area, and acuminata were the most in the anal area.

DISCLOSURE

Acknowledgments

We want to express gratitude to the Head of the Department of Dermatology and Venereology of Faculty of Medicine Universitas Sumatera Utara and Universitas Sumatera Utara Hospital.

Author Contribution

All authors have contributed to all processes in this research, including preparation, data gathering, analysis, drafting, and approval for publication of this manuscript.

Funding

The authors are responsible for all of the study funding without a grant or any external funding source.

Conflict of Interest

The authors declare no conflict of interest regarding the publication of this article.

REFERENCES

- Mayer KH, Carballo-Diequez A. Homosexual and Bisexual Behavior in Men in Relation to STDs and HIV Infection. In: Holmes KK, Sparling PE, Stamm WE, Piot P, Wasserheit JN, Corey L, Cohen MS, Watts DH, editors. Sexually Transmitted Diseases. 4th edition. New York: McGraw-Hill; 2008.p.203-18.
- Wisnu MNM. Kondiloma akuminata perianal pada laki-laki yang berhubungan seksual dengan laki-laki yang terinfeksi human immunodeficiency virus. Laporan Kasus. Bali: Bagian Ilmu Kesehatan Kulit dan Kelamin Fakultas Kedokteran Universitas Udayana; 2016.
- Lin C, Lau JTF, Ho K, Lau MC, Tsui HY, Lo KK. Incidence of Genital Warts among the Hong Kong General Adult Population. *BMC Infectious Diseases*. 2010;10:272.
- Wilvestra S, Anum Q, Isramiarti. Perbedaan Tipe Human Papilloma Virus antara Human Immunodeficiency Virus Positif dan Negatif pada Pasien Kondiloma Akuminata Anogenital. *Periodical of Dermatology and Venereology*. 2019;31(2):131-137.
- Aswar A. Karakteristik Pasien Kondiloma Akuminata di RSUP Haji Adam Malik Medan Periode 1 Januari 2008-31 Desember 2011. Skripsi. Medan: Fakultas Kedokteran Universitas Sumatera Utara; 2012.
- Sitepu EEL. Karakteristik Pasien Kondiloma Akuminata pada Anogenital Dengan Human Immunodeficiency Virus (HIV) Di RSUP Haji Adam Malik Medan Periode Januari 2012 - Desember 2017. Tesis. Medan: Departemen Ilmu Kesehatan Kulit dan Kelamin FK USU; 2019.
- Rucitra CN. Proporsi Virus Papiloma Humanus Oral dan Hubungannya dengan Frekuensi Seks Oral pada Pasien Kondiloma Akuminatum Anogenital. Tesis. Jakarta: Program Pendidikan Dokter Spesialis Ilmu Kesehatan Kulit dan Kelamin FKUI; 2014.
- Patel H, Wagner M, Singhal P, Kothari S. Systematic review of the incidence and prevalence of genital warts. *BMC*. 2013;13:1-14.
- Indriatmi W, Zubier F. Kondiloma Akuminata. In: Daili SF, Nilasari H, Indriatmi W, Zubier F, Rowawi R, Pudjiati SR, editors. Infeksi Menular Seksual. 5th edition. Jakarta: Badan Penerbit Fakultas Kedokteran Universitas Indonesia; 2017.p.176-87.
- Oktaviyanti RN, Barakbah J. Profil Pasien Kondiloma Akuminata. *Periodical of Dermatology and Venereology*. 2018;30(3):240-7.
- Dietz CA, Nyberg CR. Genital, Oral, and Anal Human Papillomavirus Infection in Men who Have Sex with Men. *J Am Osteopath Assoc*. 2011; 111(3 suppl 2): S19-25.
- Kreimer A, Campbell CP, Lin, H. Incidence and clearance of oral human Papilloma virus infection in men: the HIM cohort. *Lancet*. 2013;382(9895):877- 87.
- Sung J, Ahn, E, Oh H-K, et al. Association of immune status recument anal condyloma in human immunodeficiency virus positive paticnts. *J Korean Soc Colproctol*. 2012;28(6):294-8.
- Jeo WS, Sugiharto B, Kekalih A. Perianal Condyloma Acuminata: Factors that Contribute to the Recurrence. *The New Ropansuri Journal of Surgery*. 2018;3(2):31-3.
- Dhumale SB, Sharma S, Gulbake A. Ano-Genital Warts and HIV Status- A Clinical Study. *Journal of Clinical and Diagnostic Research*. 2017;11(1):1-4.
- Saputra N. Karakteristik Kejadian Kasus Kondiloma Akuminata di Indonesia. *Muhammadiyah Journal*. 2020;1(1):25.
- Wahyuni CU. Faktor-faktor yang Mempengaruhi Terjadinya Infeksi HPV 16/18. Tesis. Surabaya : Program Pascasarjana Universitas Airlangga; 2002.
- Effendi A, Silvia E, Hernisa MP. Analisis Faktor-faktor yang Berhubungan dengan Kondiloma Akuminata Di Poliklinik Kulit dan Kelamin RSUD Dr. H. Abdul Moeloek Bandar Lampung Tahun 2016. *Jurnal Ilmu Kedokteran Dan Kesehatan*. 2017;4(1):8-11.
- Sulistyaningrum S. Identifikasi Tipe Human Papilomavirus pada Berbagai Bentuk Klinis Kondiloma Akuminatum di Poliklinik Kulit dan Kelamin RSUPN Dr. Ciptomangunkusumo. Tesis. Jakarta: Program Pendidikan Dokter Spesialis Departemen Ilmu Kesehatan Kulit dan Kelamin FKUI. 2013.
- Ali KBM, Abdul-jabbar M, Al-Soudani A, Ismail AS. Clinical and epidemiological patterns of ano-genital warts among male patients in Erbil city, Iraq. *Annals of the College of Medicine*. 2012;38(2):28-34.
- Giuliano AR, Tortolero-Luna G, Ferrer E, Burchell AN, de Sanjose S, Kjaer SK, et al. Epidemiology of Human Papillomavirus Infection in Men, in Cancers other than Cervical and in Benign Conditions. *Vaccine*. 2008;26(10).
- Cong X, Sun R, Zhang X, Wang Y, Wang L, Yu Y. Correlation of human papillomavirus types with clinical features of patients with condyloma acuminatum in China. *International Journal of Dermatology*. 2016;55(7):775- 80.
- Che YM, Wang JB, Liu YH. Correlation between deoxyribonucleic acid loads of human papillomavirus and recurrence of condylomata acuminata. *Int J STD AIDS*. 2005;16:605-7.
- Woodman CB, Collins S, Winter H, Bailey A, Ellis J, Prior P, et al. Natural history of cervical human papillomavirus infection

- in young women: a longitudinal cohort study. *Lancet*. 2001;357:1831-6.
25. Leung AKC, Barankin B, Leong KF, Hon KL. Penile warts: An update on their evaluation and management. *Drugs Context*. 2018;7:1-14.
 26. Florez-Diaz E, Sereday KA, Ferreira S, Sirak B, Sobrinho JS, Baggio ML, et al. HPV-11 variability, persistence and progression to genital warts in men: The HIM study. *Journal of General Virology*. 2017;98(9):2339-42.
 27. Koefoed K, Sand C, Forslund O, et al. Prevalence of human papillomavirus anal and oral site among patients with genital warts. *Acta Derm Venereol*. 2013;94:15.
 28. Leszczyszyn J, Lebski I, Lysenko L, Hirnle L, Gerber H. Anal warts (Condylomata Acuminata) - Current issues and treatment modalities. *Adv Clin Exp Med*. 2014;23(2):307-11.
 29. Anum Q, Lestari S, Hasriningrum TP, Putri EK. Manifestasi klinis kutil kelamin pada pasien poliklinik kulit dan kelamin RS dr. M. Djamil Padang. *Mdvi*. 2016;42:89-93.
 30. Wiraguna AAGP, Puspawati NMD. Condyloma acuminatum in a 62-year-old patient with HIV infection. *Bali Med J*. 2020;9(1):91-4.
 31. Ratnasari DT. Kondiloma Akuminata. *Ilmiah Kedokteran Wijaya Kusuma*. 2018;5(2):18-21.
 32. Hastuti R, Mustifah EF, Ellistasari EY. Kombinasi Krioterapi dan KOH 5% untuk Terapi Kondiloma Akuminata Raksasa dengan Infeksi HIV. 2018;45(7):524-7.
 33. Na K, Sung JY, Kim HS. Clinicopathological Characteristics of High-grade Squamous Intraepithelial Lesions Involving Condyloma Acuminatum. *Anticancer Research*. 2018;38(3):1767-74.
 34. Chan MP. Verruciform and condyloma-like squamous proliferations in the Anogenital Region. *Arch Pathol Lab Med*. 2019:1-11.
 35. Niode NJ, Oroh EEC, Warouw WFT, Daili SF. Kondiloma Akuminata Raksasa pada Pasien AIDS. *Media Dermatovenereologica Indosiana*. 2012;165-8.



This work is licensed under a Creative Commons Attribution