

## Relationship between hemoglobin A one C level and abnormal pap smear findings on diabetic patients at Omdurman military hospital, 2022.

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### Abstract:

Background: the incidence and prevalence of gynecologic cancers are increased in patients with type two diabetes mellitus. It have several common mechanisms with type two diabetes mellitus. A lot of diabetic patients when screened for pap smear they were suffering from increased vaginal discharge and genital tract infections, cellular changes , malignancy. Objective: To evaluate relationship between HbA1C level and abnormal pap smear findings in diabetic patient at Omdurman military hospital. Methods: this is a case control hospital base study, the patients who requested for pap smear during study period. Data was collected using structured questionnaire. Statistical analysis is performed using SPSS, R language. (109) participants of control group are included in this paper. Results: (9) (32.14%) of normal range of HbA1C below (5.7) got normal pap smear results (negative), (40) (49.38%) got abnormal pap smear results (positive), (9) (32.14%) of abnormal pre diabetic range (5.7-6.4) got normal pap smear results (negative), (26) (32.9%) got abnormal pap smear results(positive) , (10) (35.7%) of abnormal diabetic range above (6.5) got normal pap smear results (negative) , (15) (18.51%) got abnormal pap smear results(positive) .

**Key words:** pap smear, cervical cancer, diabetes mellitus, HbA1C ( hemoglobin A one C)

## علاقة معدل فحص السكري التراكمي مع مسح عنق الرحم في مريضات السكري

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المستخلص:

تعتبر اورام النساء في حاله تزايد من حيث الحدوث ومعدل الانتشار وسط المرضى المصابين بسكري الدم الغير معتمد علي الانسلين, كما ان لديها اليات حدوث مشتركه مع سكري الدم الغير معتمد علي الانسلين. العديد من مرضي السكري عندما تم فحصهم بمسحه عنق الرحم وجد انهم يعانون من زياده الافرازات المهبلية , عدوي الممرات التناسليه, التخيرات الخلويه والسرطانات. الهدف: تقييم العلاقة بين معدل سكري الدم التراكمي والنتائج الغير طبيعيه لمسحه عنق الرحم في مرضي السكري بمستشفى امدرمان العسكري . طريقه البحث العلمي: هذه دراسه وصفية لحاله والشاهد تجري بالمستشفى تستهدف المرضى الخاضعين لفحص مسحه عنق الرحم اثناء وقت الدراسه تم جمع البيانات باستخدام الاستبيان المصمم لغرض الدراسه, وقد تم تحليل البيانات باستخدام برنامج حزمه التحليل الاحصائي للعلوم الاجتماعيه. تتضمن هذه الورقه (109) مشارك يمثلون مجموعه حاله. النتائج: (32.14%) من المشاركين لديهم معدل سكر الدم التراكمي طبيعي وهو اقل من (5.7) هؤلاء قد تحصلوا علي فحص مسحه عنق الرحم طبيعي (سليبي) , (49.38%) منهم تحصلوا علي نتائج غير طبيعيه ( ايجاييه). (32.14%) من المجموعه الحاصله علي معدل متوسط لفحص السكر التراكمي (معدل ما قبل الاصابه) والذي يساوي (5.7)- (6.4) تحصلوا علي نتائج طبيعيه لمسحه عنق الرحم (سليبيه) , (32.9%) منهم تحصلوا علي نتيجة غير طبيعيه ( ايجاييه). (35.7%) من المجموعه الحاصله علي معدل غير طبيعي لفحص السكر التراكمي (معدل الاصابه) وهو اعلي من (6.5) ) تحصلوا علي نتائج طبيعيه لمسحه عنق الرحم (سليبيه) , (18.51%) منهم تحصلوا علي نتائج غير طبيعيه ( ايجاييه).  
الكلمات المفتاحيه: مسحه عنق الرحم, سرطان عنق الرحم, مرض السكر, معدل سكر الدم التراكمي.

### Introduction:

The incidence and prevalence of gynecologic cancers are increased in patients with type two diabetes mellitus, it have several common mechanisms with type two diabetes mellitus. The management of insulin resistance is a main factor in controlling blood glucose and preventing cancer in diabetic patients. (1)(2) Also there is a significant relationship between history of increased

blood sugar levels with vaginal discharge in patients with type 2 diabetes.(3) Type one diabetes mellitus mothers associated with mild a typia (atypical squamous cells of undetermined significance (ASCUS). There is a low level of pap smear screening among Sudanese women. (4) (5) Pap smear is a microscopic examination of cells scraped from the cervix and is used to detect cancerous or pre-cancerous conditions of the cervix or other medical conditions. It still incomplete In Sudan due to lack of infrastructures and trained healthcare professionals, poor health care access, and lack of awareness. It done on an opportunistic occasion. (6)(7) Earlier diabetes was thought of as a disease of the upper socioeconomic class and cervical cancer was associated with lower socioeconomic class, but in the light of recent trends noted both in prevalence of diabetes and cervical cancer their association needs to be studied further. When the pap smear findings of diabetics were compared to non-diabetics in study performed in India, more than 70% patients were found to have positive findings in their samples including malignancy, infection and inflammation, vaginitis , vaginal dryness , infections , urinary tract infections , yeast infections, candida virginitis and resistant vulvovaginitis as well as gestational diabetes mellitus. (8)(9)(10)(11). in many developed countries and have not yet been implemented in most developing countries.(12)

General objective:

To evaluate relationship between HbA1C level and abnormal pap smear findings in diabetic patient at Omdurman military hospital.

### **Methods:**

This is case control, Hospital based study was carried out in Omdurman military hospital - Oncology clinic which is a section in obstetric and gynecological hospital inside Omdurman military hospital, it provides diagnostic (such as pap smear), therapeutic and follow up services for military covered oncology patients, also

it receives the referred patients from another hospital and even from outside Khartoum state and serves them even if they are not military covered. The targeted populations Composed of women who have been requested for pap smear in Omdurman Military Hospital's oncology clinic at the time of the study includes diabetic and non diabetic participants. Structured questionnaire formulated by the researcher based on the literature, it is composed of three parts , first part is demographic data , second part is answering the variables of specific objectives, third part for conclusion of pap smear results, questionnaire was filled by the researcher during waiting time of participants. A single questionnaire filling time took about five to seven minutes from each participant time. face to face interview method for the participants who were been met life and telephone interview method for the participants who were been taken from the records at the time of the study, Convenience selection of sample is used , Certain factors that may be confounding and may affect results of pap smear were used to exclude participants from this study , those factors include ( HPV , Sexual history , Smoking history , Weakened immune system , Long term contraception , Age at first pregnancy , Fruit and vegetables consumption , DES , Family history of cervical cancer, Chlamydia infection). After data collected it cleaned, coded and tabulated then entered SPSS software version 19 for analysis using Pearson Correlation and Chi Square test. The research was respected the rights of participants, Consent was obtained from all participants after explanation.

### **Results:**

#### 1.HbA1C:

(83.1 %) of participants recived secondary education, about half of them (45.4 %) live in Omdurman state, (51%) of them are young adulthood and (46%) middle age. (49) (45%) of participants results of HbA1C within normal range below (5.7), (35)

(32.1%) of them with in abnormal prediabetic range (5.7-6.4), (25) (22.9%) of them whith in abnormal diabestic range (6.5) and above. (Table one)

## 2.Results of pap smear:

(28) (25.7%) of participants cases have got normal result of pap smear (NILM\negative), (84) (77.1%)of control get normal result (NILM\negative), (81) (74.3%) of cases get abnormal results include ( inflammation, infection signs, ASCUS, AGUS, metaplastic changes), (25) (22.9%) of control get abnormal results include ( inflammation, infection signs, ASCUS, AGUS, metaplastic changes) . (p value= 0, highly significant). (Table two)

## 3.Results of pap smear for each HbA1C range group:

(9) (32.14%) of normal range below (5.7) got normal results, (40) (49.38%) got abnormal results include (inflammation, infection signs, ASCUS, AGUS, metaplastic changes), (9) (32.14%) of abnormal pre diabetic range (5.7-6.4) got normal results, (26) (32.9%) got abnormal results include (inflammation, infection signs, ASCUS, AGUS, metaplastic changes), (10) (35.7%) of abnormal diabetic range above (6.5) got normal results, (15) (18.51%) got abnormal results include (inflammation, infection signs, ASCUS, AGUS, metaplastic changes). (Table three)

4.Chi Square= Pearson Chi-Square Likelihood Ratio N of Cases a symptomatic significance by p value = .000 , Odd ratio = 302.212218.

## Discussion:

This analysis is in R language. (44.9%) have controlled diabetes with HbA1C below (5.7) , the rest (55.1%) have no controlled diabetes this explain the increased percentage of abnormal pap test result and infections. The total of abnormal result among case group is (74.3%) most of them were inflammation and ASCUS together (17.4%) followed by inflammation alone (11.9%). (49.38%) of normal range HbA1C (below 5.7) got abnormal pap

smear include (inflammation, infection signs, ASCUS, AGUS, metaplastic changes), while (50.62%) of abnormal range pap smear pre diabetic (5.7-6.4) & diabetic (6.5 & above) got abnormal pap smear include (inflammation, infection signs, ASCUS, AGUS, metaplastic changes). In this study Candida infection in diabetic group (7.3%) exceed that of non diabetic group (.9%) which supported by a retrospective Case Control Study of Pap smear which revealed that Candida is greater in diabetic ladies in comparison to non diabetic ladies.(13) as well as Postgraduate Program in Health Sciences, Maringá, Brazil studied host elements that would predispose ladies to increase recurrent vulvovaginal candidiasis (RVVC), one of them glycemia, told that Diabetes mellitus and insulin resistance had been extra related to positive culture groups than the passive ones.(14) As well as analytic correlation with cross sectional approach research for the correlation of diabetes mellitus with occurrence of flour albus in the middle age ladies discovered a huge correlation among the incidences of diabetes mellitus with the middle age Fluor salbus (vaginal discharge) in ladies. It is usually recommended for ladies with diabetes to maintain blood glucose within normal limits to lessen the occurrence of vaginal discharge due to the fact hyperglycemia worsens the state of vaginal discharge.(15) There is no relation between Level of HbA1C and findings of pap smear, so about half (49.38%) of normal level of HbA1C (5.7) have got abnormal pap smear results in spite that their diabetes seems controlled according to HbA1C level and just about third (32.9%) of abnormal pre diabetic range (5.7-6.4) have got abnormal results, and abnormal diabetic range above (6.5) got (18.51%) of them have got abnormal pap smear results. So there is no significance value and there is no real deference that could be took in consideration when carrying out the odd ratio, at the first level without changing the cases = 1/control=0, and after change also, no significant value are detected too.

## Recommendations:

1. Considering results of this study it is recommended to make pap test applicated according to the world health organization cervical screening guide lines.
2. It is been recommended to make pap test available in health care settings and put financial budget for that.
3. It is recommended to diabetic patients to be very strong in controlling their diabetes mellitus because poorly controlled diabetic patients had positive pap smears.

## Conclusion

There is association bettween diabetes mellitus and infections, There is no relation between Level of HbA1C and findings of pap smear so about half of normal level of HbA1C have got abnormal pap smear result and just third of abnormal level of HbA1C have got abnormal pap smear results. So there is no significance value and there is no real deference that could be took in consideration when carring out the odd ratio, at the first level without changing the cases = 1/control=0, and after change also, no significant value are detected too.

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## Tables of Results

Table (1): level of HbA1C

level of HbA1C	Case	Control	Total
Not diabetic	(0%)0	(50%)109	(50%)109
Normal (below (5.7%	(22.5%)49	(0%) 0	(22.5%)49
Abnormal (5.7%- (6.4%	(16.1%)35	(0%) 0	(16.1%)35
Abnormal above( (6.5%	(11.5%)25	(0%)0	(11.5%)25
Total	(50%) 109	(50%) 109	(100%)218

Table (2): findings of pap smear

Results	Case	Control	Total
(NILM(negative	(25.7%) 28	(77.1%) 84	(51.5%) 112
inflammation, infection signs, ASCUS, AGUS, metaplastic changes	(74.3%) 81	(22.9%) 25	(48.5%)6 10
Total	(50%) 109	(50%) 109	(100%) 218

Table (3): findings of pap smear for each HbA1C range group

Result	Normal be- low (5.7	Pre diabetic ((5.7-6.4	Diabetic (6.5) & .above	Total
Normal(NILM\ (negative	(32.14%)9	(32.14%)9	(35.7%) 10	(25.68%)28
Abnormal results	(49.38%)40	(32.09%)26	(18.51%)15	(74.3%)81
Total	(44.9%)49	(32.11%)35	(22.93%)25	(100%)109

Table (4): Chi-Square Tests :

	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	218.000 <sup>a</sup>	3	.000.
Likelihood Ratio N of Cases	302.212218	3	.000.

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