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Syndromes associated with sexually transmitted infections: Prevalence and risk factors among women of childbearing age in Morocco

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Nezha Nacer[1], Najat Fatimi[2], Samia Rkha[1] and Nadia Ouzennou[1,3]*

Laboratory of Pharmacology, Neurobiology, Anthropobiology, Environment and Behavior / Biology/ /Faculty of Sciences Semlalia/ Cadi Ayyad University, Marrakech. Morocco[1]; General practitioner at the Rahal Ben Ahmed Health Center, Essaouira Health Province, Morocco[2]; Higher Institute of Nursing and Health Techniques of Marrakech, Morocco[3]

***For Correspondence:** Email: *nezha.nacer@ced.uca.ma;* Phone: *(+212)707130513*

Abstract

This research was designed to determine the prevalence and risk factors associated with syndromes of sexually transmitted infections in women of reproductive age in the province of Essaouira in Morocco. A questionnaire was distributed to 1100 women using a random sampling technique. Subsequently, a clinical and speculum examination was performed. In this study, 38.6% of the women examined had syndromes of sexually transmitted infections, of which 81.8% had a vaginal discharge. Diagnosed sexually transmitted infection syndromes have been influenced by a woman's level of education, socio-economic status, marital status, obstetric history, and whether the partner is suspected of having other sexual relations. This study revealed a high prevalence of sexually transmitted infection syndromes, and that demands more effort in diagnosis and management should be made. *(Afr J Reprod Health 2022; 26[9]: 94-102).*

Keywords: Syndrome, sexually transmitted infections, risk factors, prevalence

Résumé

Cette recherche a été conçue pour connaître la prévalence et les facteurs de risque associés aux syndromes d'infections sexuellement transmissibles chez les femmes en âge de procréer à la province d'Essaouira au Maroc. Un questionnaire a été distribué à 1100 femmes en utilisant une technique d'échantillonnage aléatoire. Par la suite, un examen clinique et au spéculum ont été effectués. De plus, la présente étude a montré que 38,6 % des femmes examinées avaient des syndromes d'infections transmissibles sexuellement, dont 81,8 % de pertes vaginales. Les syndromes d'infections sexuellement transmissibles diagnostiquées ont été influencés par le niveau de scolarité de la femme, son statut socioéconomique, son état matrimonial, ses antécédents obstétricaux et la question de savoir si le partenaire est soupçonné d'avoir d'autres relations sexuelles. Cette étude a révélé une prévalence importante des syndromes d'infections sexuellement transmissibles et plus d'effort en matière de diagnostic et de prise en charge devraient être fait. *(Afr J Reprod Health 2022; 26[9]: 94-102).*

Mots-clés: Syndrome, infections sexuellement transmissibles, facteurs de risques, prévalence

Introduction

Sexually Transmitted Infections (STIs) remain a public health problem in many countries, mainly in low-income countries[1]. More than one million STIs are contracted every day around the world[2]. Africa has the highest number of STI cases in the world. For instance, in Ethiopia, for example, the prevalence of STIs was 26.6% among pregnant women[3]. The prevalence was 19.4% in Swaziland[4], 23% in Algeria[5], 69.7% in Mali[6] and 48% in Tunis[7]. In Morocco, in 2019, data from public health services reported an annual number of cases of around 440,000 STIs, of which 59,669 were urethral discharges and nearly 18,616 genital ulcers, the remainder being represented by vaginal discharge[8].

The Sustainable Development Goals (SDGs) in Target 3.1 aimed to end preventable maternal morbidity and mortality of newborns and under-five by ending mother-to-child transmission (PMT) of syphilis and other STIs[9]. As a result,

many of the effects of sexually transmitted infections are preventable if universal access to sexual and reproductive health services is guaranteed[10]. In this sense, the WHO recommends the use of standardized protocols (syndromic approach) to ensure all patients the same treatment, at all levels of care, facilitate the training and supervision of caregivers, delay the onset of antimicrobial resistance and ensure a rational supply of medicines[11]. The syndromic approach uses flowcharts to guide diagnosis and treatment[4-12]. Currently, in resource-poor environments, where laboratory tests are not available and/or expensive, of the most effective national surveillance systems are those based on syndromic surveillance[13]. In Morocco, STIs are a priority area of intervention of the Ministry of Health[8]. In this context, the syndromic approach to the management of STIs, launched by the World Health Organization (WHO), was adopted and generalized across all basic health care facilities in 2001[14].

Three algorithms have been selected for the management of urethral discharge syndromes, genital ulceration, vaginal discharge, and/or lower abdominal pain[15]. The reporting of STI cases is carried out at the level of all health services in Morocco on the basis of a quarterly sheet that summarizes the cases of STI syndromes supported during period[8]. For cases of STI diagnosed and on the basis of a free and informed consent HIV and syphilis testing is offered. However, several barriers remain, including diagnosis, management of asymptomatic STIs, routine syphilis and HIV testing, and under-reporting of STI cases[14]. Essaouira province does not escape this reality. Indeed, as part of the epidemiological surveillance of STI cases, the province reported 7039 new STI cases for the year 2020[16]. However, according to these officials, this data is far from representing reality. Moreover, as part of a survey on maternal morbidity in the province of Essaouira, STIs represent 50.1% of the signs of maternal morbidity mentioned by the women interviewed[17].

Thus, in order to improve STI services, the WHO Global Health Sector Strategy on STI (2016-2021) has established a roadmap for the prevention and control of STI[18]. The first step in this roadmap is to collect data on the incidence and prevalence of STIs[19]. Estimates of the prevalence and incidence of STIs help to describe the magnitude of the burden. These estimates also highlight the need for increased screening for STIs[20]. Thus, the availability of epidemiological data on STIs and their associated factors in women of reproductive age is essential for the development of effective prevention strategies[17- 21]. Therefore, this study aims to assess the prevalence and risk factors associated with STI syndrome in women of reproductive age in the province of Essaouira in Morocco.

Methods

Study setting

The study was conducted in the province of Essaouira which is part of the region of Marrakech-Safi, a city on the Atlantic Ocean, located 174 km west of the city of Marrakech and 173 km north of Agadir. The province had a total population of 77,966 in 2014 divided into two axes, the Haha axis and the Chiadma axis. It is characterized by a rural predominance of 77.6%.

Design

A cross-sectional study was carried out among women of reproductive age attending Maternal and Child Health cells (for pregnancy monitoring, family planning, vaccination and signs of STI) in 20 health centers in 69 urban and rural centers, randomly selected. Stratified random sampling was adopted to identify the number of participants per centre, based on the number of women of reproductive age served by each centre. The required sample size was determined using the Ficher formula. Thus 1100 women were included. Participants were randomly selected during their visits to health centers until the number per centre was reached. Before the questionnaire was administered, the volunteer participants had received all the necessary information about the study before signing the informed consent form. A structured questionnaire was administered to obtain detailed data on socio-demographic, socio-economic and health characteristics as well as sexual history and behaviour. Subsequently, a clinical examination was carried out, followed by an inspection of the perineal, vulvar, vaginal, and cervical regions of each woman in search of ulcers, discharge, inflammation, or sensitivity. Finally, a speculum examination in the presence of the doctor, a midwife, or a nurse from the SMI cell and a rapid

HIV and syphilis test were carried out. Participants with STI syndrome or/and who tested positive for one or more STIs were treated in accordance with the STI syndromic management protocol adopted in Morocco and were invited to return in a week for review. They were also invited to communicate to their sexual partners their interest in going to the health structure to be diagnosed and treated and condoms were provided.

Data management and analysis

IBM®SPSS® version 18 (Statistical Package for the Social Sciences) was used for statistical capture and analysis. Qualitative variables have been described by numbers and proportions, and quantitative variables by their measures of central tendency and dispersion. Binary logistic regression consisted of eliminating confounding factors and capturing the weight of variables associated with STI syndromes. Statistical significance was set at the 5% threshold.

Results

A total of 1100 women agreed to participate in the survey. They were examined, interviewed and their data was completed through the use of their health diaries.

Socio-demographic, socio-economic and health profile

Table 1 shows the socio-demographic, socio-economic, and health characteristics. The age of women ranged from 16 to 49, 36% were over the age of 35, with an average of 30.6 years (SD=8.1). Urban women accounted for 37.2%, and those in rural areas for 62.8%, including 10.5% in semi-urban areas. The illiteracy rate was 27.1% and 53% had not reached the primary level. The percentage of women with secondary education or higher was 19.9%. The monthly household income varies according to women's declarations, from zero to 24,500 Dirhams, or an average of 2,706 Dirhams (Moroccan currency equivalent to 348 American Dollar (USD).

Regarding monthly income, the women studied were divided into two parts according to the value of the Guaranteed Interprofessional Minimum Wage (GIMW) in Morocco in 2021; which is 2,828.71 Dirhams per person[22] the equivalent of USD 304.59. The first group had a relatively low socio-economic level and includes households with monthly incomes below or equal to the GIMW and the second group with an average socio-economic level to be raised at the national level. Family income was calculated on the basis of the income of the husband and wife, however, the proportion of women who had a socio-professional activity at the time of the survey was only 16.4%. Thus, 53.5% of women belonged to the first group. As for health insurance, nearly half of women (55%) benefit from it. In terms of distance from the nearest health structure, 29.6% lived within three kilometers and 33.4% more than six. Married women accounted for 96.9%. 35% of women were pregnant at the time of the survey. Compared to the previous history, 18.3% had a history of obstetrics (abortion, fetal death, prematurity). Other health problems were reported in 11% of cases including diabetes, high blood pressure, kidney problems, and psychological disorders.

STI syndromes and factors

425 women examined (38.6%) had STI syndromes, of which 81.8% had vaginal discharge (Table 2). One person tested positive for rapid HIV and another 12 for rapid syphilis. The HIV/syphilis Dual Rapid Diagnostic Test (DRT) was used after the consent of participants. People diagnosed with STI syndrome and those whose rapid HIV and syphilis tests were positive were treated according to the protocols recommended in Moroccan health facilities.

According to the results in Table 3, 42.3% of women who showed signs of STIs were in the 25-34 age group, 85.3% of unmarried women, 43.5% of urban residents, 66.8% of illiterate women, 52% of the low socio-economic level, 79.2% had a history of obstetrics including 80.2% of abortions, 77.4% of those with multiple sexual partners in the past three months and 70.4% of those who suspect the partner of having other sexual partners. STI syndrome was statistically associated with women's level of education (p=0.000), marital status (p=0.000), socioeconomic level of the family (p=0.000), distance from the nearest health structure (p=0.000), history of obstetrics (p=0.000), partner suspected of having other sexual partners (p=0.000), having multiple sexual partners in the past 3 months (p=0.000), age of the first report (p=0.001)Place of residence (p=0.006) and being

Table 1: Socio-demographic, socio-economic and health profile

Socio-demographic, socio-economic and health characteristics		Number (%)
Age	< 35	704 (64)
	≥ 35	396 (36)
Place of residence	Urban	409 (37,2)
	Rural	691 (62,8)
Educational level	lliterate	298 (27,1)
	Primary	583 (53)
	Secondary and above	219 (19,9)
Marital status	Married	1066 (96,9)
	Unmarried	34 (3,1)
Parity	Nullipare	219 (19,9)
	Primiparous	519 (47,2)
	Multipare	362 (32,9)
Family income	< GIMW (2,828.71 DH)	564 (53,5)
	> GIMW (2,828.71 DH)	488 (46,5)
Social security cover	Yes	605 (55)
	No	495 (45)
Distance to care facilities	< or = 3km	326 (29,6)
	>3km and < or = 6 km	407 (37)
	>6 km	367 (33,4)
ATCD obstetric	Yes	144 (13)
	No	956 (87)
Pregnant woman	Yes	385 (35)
	No	715 (65)

%: Percentage; GIMW*:* Guaranteed Interprofessional Minimum Wage*; DH: Dirhams ; Km :* kilometre

Table 2: Nature of STI syndrome and results of rapid HIV and syphilis tests

Nature of STI syndrome and results of rapid HIV and syphilis tests	Number (%)
Nature of STI syndrome (N=425)	
Vaginal discharge	348 (81,8)
Genital ulceration	62 (14,7)
Pelvic pain	15 (3,5)
Rapid test results:	
HIV rapid Test	1 (0,1)
Syphilis rapid test	12 (1,1)

n: number of syndromes detected by examination. %: n/ Total number of women diagnosed with STI syndrome (N=425)

pregnant (p=0.015). Age, social coverage, parity, and condom use during the last sexual intercourse if in doubt were not associated with STI syndro. According to the binary logistic regression model (Table 4), the socio-demographic economic and health factors that represented significant and independent determinants of the presence of STI syndromes were numerous; women's level of education (Odds Ratio (OR)= 0.154; CI 0.088- 0.270), marital status (OR=5.538; CI 1.047- 29.303), family income (OR=0.318; CI 0.232- 0.436), obstetric history (OR=0.140; CI 0.87- 0.225), age of first sexual report (OR=0.278; CI 0.122- 0.636), the distance from the nearest health structure (OR=0.597; CI 0.371- 0.960) and the suspected multiple sexual partners (OR=3.731; CI 1.405- 9.908). Similarly, Cox & Snell's R-two and Nagelkerke's R-two indicated that between 26.1% and 35.5% of the variability in the risk of infection with STI syndrome is collectively explained by the significant factors present in Table 4.

In addition, the model obtained from the multivariate logistic regression (Table 4) shows that the significant and independent determinants ($p<0.001$) that a woman is more likely to suffer from STI syndrome are educational level (OR= 4.756; CI 2. 694-8.397; $p<0.001$), family income (OR=2.832; CI 2.079- 3.856; $p<0.001$) and obstetric history (OR=6.748; CI 4.201- 10.482; $p<0.001$).

Discussion

Despite the taboo connotation of STIs, few people had refused to participate in the survey (32/1132), thus showing how interested this population was in the prevention and screening of STIs. Moreover, untreated STIs can lead to serious and irreversible health problems and have a considerable impact on maternal and neonatal morbidity especially since STI carriers are among the groups vulnerable to HIV infection[20]. The present study involved 1100 women, the results showed that 38.6% had STI syndromes, one person tested positive for HIV, and 12 had syphilis. This means that women in the province were at risk of infection and their health would be at risk without proper screening and management.

These results corroborated those of other studies in Morocco; that of Essaouira which specified that STIs represented 50.1% of the symptoms suggestive of maternal morbidity reported by the women surveyed in Essaouira[17], that of Fez with 40%[23], that of Rabat with 11%[24] and that of Marrakech with 11%b[25]. These results are not far from other low- and middle-income countries such as India (52.6%)[26], Kenya-Pakistan (73.5%)[26], Algeria (43%)[7] and Ethiopia (33,3 %)[10]. This difference in the prevalence of STIs between studies could be due to specificities in relation to awareness or knowledge of STIs, differences in access to health care services, and socioeconomic and demographic characteristics. Compared to the main STI syndromes diagnosed after examinations

Table 3: Sexually transmitted infection syndrome and associated factors

Variables	Modalities	N	STI syndrome n (%)	Test χ2
Age	< 35	704	277 (39.3)	3,395^{ns}
	≥ 35	396	148 (37,3)	
Educational level	lliterate	298	199 (66,8)	142,270***
	Primary	583	179 (30,7)	
	Secondary and above	219	47 (21,5)	
Place of residence	Urban	409	178 (43,5)	6,552**
	Rural	691	247 (35,7)	
Marital status	Married	1066	396 (37,1)	32,215***
	Unmarried	34	29 (85,3)	
Family income	< GIMW (2,828.71 DH)	588	306 (52)	95,739***
	> GIMW (2,828.71 DH)	512	119 (23,2)	
Social security cover	Yes	605	247 (40,8)	2,720*
	No	495	178 (30)	
Distance to care facilities	< or = 3km	326	180 (55,2)	59,423***
	>3km and < or = 6 km	407	145 (35,6)	
	>6 km	367	100 (27,2)	
Age of first sexual intercourse	<18-years	1014	382 (37,7)	13,535**
	>=18-years	86	43 (50)	
ATCD obstetric	Yes	144	114 (79,2)	114,802***
	No	956	311 (32,5)	
Parity	Nullipare	219	84 (38,4)	0,344 ^{ns}
	Primiparous	519	205 (39,5)	
	Multipare	362	136 (37,6)	
Pregnant woman	Yes	384	167 (43,4)	5,861
	No	716	258 (36,1)	
Multiple sexual partners in the past 3 months	Yes	31	24 (77,4)	20,237**
	No	1069	401 (77,4)	
Partner suspected of having other sexual partners	Yes	27	19 (70,4)	12,769***
	No	1073	406 (37,8)	
Condom use during last sexual intercourse if in doubt	Yes	36	18 (50)	2,027 ^{ns}
	No	1064	407 (38,3)	

**:p<0,05; **: p<0,01; *** : p<0,001 ;* ns: non significative

Table 4: Binary and multivariate analysis of factors associated with sexually transmitted infection syndromes

Variables	Binary logistic analysis					Multivariable logistic analysis				
	A	χ2	OR	IC		A	χ2	OR	IC	
Place of residence	-0,148	0,813^{ns}	0,863	0,626	1,189	0,032	0,034^{ns}	1,033	0,735	1,451
Distance from nearest health structure	-0,517	4,524*	0,597	0,371	0,960	0,343	1,862^{ns}	1,409	0,861	2,304
Educational level	-1,870	42,568***	0,154	0,088	0,270	1,559	28,905***	4,756	2,694	8,397
Age of first sexual intercourse	-1,279	9,186**	0,278	0,122	0,636	1,268	5,287*	3,555	1,206	10,482
Marital status	1,712	24,216***	5,538	1,047	29,303	0,733	9,716**	2,082	1,313	3,301
Family income	-1,146	50,222***	0,318	0,232	0,436	1,041	43,652***	2,832	2,079	3,856
Obstetric history	-1,968	67,979***	0,140	0,087	0,225	1,909	62,303***	6,748	4,201	10,482
Partner suspected of having multiple sexual relationships	-1,186	5,457*	0,305	0,113	0,826	1,087	4,605*	2,965	1,099	8,003
Multiple partners last 3 months	1,057	3,322^{ns}	2,877	0,923	8,966	1,093	3,573^{ns}	2,984	0,960	9,269

*A: Constant, 2: Chi-square value, OR: Odds ratio, CI: Confidence interval; * p<0.05; **p<0.01; ***p<0.001*

come vaginal discharge (81.8%), genital ulceration (14.7%), and pelvic pain (3.5%). These results are consistent with data from public health services in Morocco in 2019, which report an annual number of cases of around 440,000 STIs, of which 59,669 urethral discharges and nearly 18,616 genital ulcers, the rest being represented by vaginal discharge[27]. This high rate of STIs at the level of this group could be explained by temporary sexual intercourse not protected by women or their spouses who work in large cities, due to the economic stagnation of the province as the rate of economic activity does not exceed 45.7% due to the fact that it is based mainly on crafts, fishing, and tourism[28].

Also, this could be the result of the perception of STIs as a taboo subject or their ignorance sometimes because of the high illiteracy in this province which is 48.9% of which 60% women; the highest in the region of Marrakech-Safi[29]. Also, the remoteness of the nearest health structure, 33.3% should cover more than six kilometers, which is in line with the national rate (39%)[30]. These findings could have been at the origin of the use of self-medication and/or traditional treatments thus influencing the correct management of STI syndromes. The bivariate analysis showed that the diagnosed STI syndromes were statistically associated, in order of importance with, education level, marital status, family income, distance from the nearest health structure, having a history of obstetrics, the partner being suspected of having other sexual partners, having multiple sexual partners in the past three months, the age of the first sexual encounter, the place of residence and being a pregnant woman.

The binary logistic regression analysis showed that only the variables education level of the woman, marital status, family income, obstetric history, age of first sexual intercourse, distance from the nearest health structure, and the partner suspected of having multiple sexual relationships were statistically associated with diagnosed STI syndromes. These results are similar to those obtained in Mozambique, Swaziland, Ethiopia, South Africa, Rabat and India[1,4,10,18,24-26]. Moreover, the STI syndromes diagnosed in women of reproductive age with a lower level of education were higher than in women with a higher level of education. This could be explained by the fact that the ignorance rate is very high in this province or by the fact that educated women have a better knowledge of STIs and are more likely to seek treatment than women without education[10, 28].

In addition, women from polygamous or unmarried marriages have a higher probability of STI syndromes than women from monogamous or widowed marriages. This could be explained by the fact that condom use in multi-partner cases is very rare in this context[17] which corroborates the results of a study in South Africa that stipulated that 90% of 19-year-old respondents had sex multiple and simultaneous condom use was low[31]. STIs are one of the leading causes of obstetric history[32].

Thus, women with a history of obstetrics are more likely to have STIs than their counterparts. This is confirmed by the study conducted in Ethiopia[10]. In the current study, women whose partners are suspected of engaging in risky sexual behavior were more likely to have STI syndrome than their counterparts. These results are similar to those in Ethiopia[10], Uganda[32] and India[33] . However, access to care for diagnosis and management of STIs was hampered by the low uptake of health services by those concerned[34].

Indeed, in Morocco, the physical and geographical accessibility of women to sexual and reproductive health care remains severely hampered by a multitude of geographical, socio-economic, educational, and cultural variables[35]. In this sense, Morocco still has disparities in access to care between urban and rural areas, despite all the efforts made[36,37]. Moreover, 70.4% of the women surveyed in this study lived more than three kilometers from the nearest treatment facility, of which 33.4% lived more than six kilometers away. In addition to this disparity in the environment, there were socio-economic conditions for women that could explain their limited use of health care[35]. In the present study, more than half (53.3%) of the respondents had a low socio-economic level (monthly family income < GIMW). In addition to the lack of economic resources, the study recorded a low level of education among women, despite Morocco's efforts to enroll girls in school, 27.1% were illiterate and 53% did not go beyond the primary level.

Moreover, women's literacy is a necessary condition for understanding health education messages. Indeed, the lack of awareness and information, and the weight of a patriarchal culture in society, also constitute obstacles to access to care, the contours of which must be defined. In this

sense, the attachment to traditional practices and self-medication may partly explain the low use of health care facilities in Morocco[36].

These findings deprived women of their rights to preventive care, health education, and other services available in health centers[25]. Within this framework, health professionals could sensitize women to the importance of benefiting from sexual and reproductive health services, including STI screening, and inform them of the care they could obtain.

Ethical considerations

Participants gave their free and informed consent to participate in this study. In addition, they were informed beforehand of the nature of the study, its authors, its objectives and the confidentiality of the data collected. An authorization from the Moroccan Association for Research and Ethics (Polydisciplinary faculty of Taroudant) as well as the authorization to collect data from the health authorities: the regional health directorate of the Marrakech region-Safi from Marrakech-Safi was obtained.

Conclusions

This study showed that the prevalence of sexually transmitted infection syndromes in women of reproductive age remains high (38.6%). Vaginal discharge and genital ulceration were the main syndromes. Multivariate analysis showed that education level, family income and obstetrical history were significant correlates of sexually transmitted infection syndromes. This means that women who had access to resources available through literacy, information, and financial stability had fewer STI syndromes. On the other hand, the prevalence of STI syndromes is higher among women with fewer resources. To reduce the prevalence of STI syndromes, it seems necessary to encourage women of reproductive age to follow their care, pregnancy, childbirth, and family planning, especially in public facilities, and to provide them with care appropriate to their health status. Health program managers can make greater efforts in health education, recruitment of women for prenatal and postnatal care, and new methods of communication and outreach. On the other hand, policymakers must act on the social determinants of health to improve access to care. The determinants observed in this study can help shape women's health in a context of high poverty and illiteracy.

Recommendations for improving practice

To allow epidemiological surveillance of STIs and to propose adequate management. The recommendations and solutions proposed by the participants stem directly from their experiences with STIs.

1. Dissemination of information through print and electronic media not only to women of childbearing age but also to the public to improve awareness, awareness of the danger of STIs, and the importance of appropriate management.
2. Increase in the number of health facilities that support STIs. The latter can be managed in any health facility because it does not require any special equipment.
3. Nurture a comprehensive and dynamic relationship between care partners to enable people to feel welcomed, appreciated, and not stigmatized.

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Contribution of authors

We declare that this work was carried out by the authors named in this manuscript and that all the responsibilities related to the claims relating to the content of this article will be borne by the authors. Nezha Nacer designed the study and participated in data acquisition, literature search, data analysis, and manuscript writing. Najat Fatimi, Nadia Ouzennou, and Samia Rkha conducted data analysis, and read and approved the manuscript for publication. All authors read the manuscript and approved the final version of the manuscript for publication.

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