HERPES

The psychosocial impact of serological diagnosis of asymptomatic herpes simplex virus type 2 infection

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Objectives: To evaluate the impact of a positive herpes simplex virus type 2 (HSV-2) serological test on psychosocial functioning among people with no known history of genital herpes.

Methods: Individuals (age 14–30 years) without a history of genital herpes were recruited from an urban university setting and sexually transmitted diseases (STD), primary care, and adolescent clinics. Participants completed a questionnaire addressing psychological functioning, psychosocial adjustment, and perceived quality of sex and were offered free HSV-2 antibody testing. 33 HSV-2 positive people and 60 HSV-2 negative people demographically matched from the same source of recruitment were re-evaluated at a 3 month follow up visit. HSV-2 positive participants also completed a genital herpes quality of life (GHQOL) measure.

Results: Of the 33 who were HSV-2 seropositive, four did not recall their diagnosis. In comparing those who were HSV-2 positive with those who were negative, repeated measures analysis of variance indicated there were no significant differences over time on any of the measures. None the less, many HSV-2 positive individuals indicated that the diagnosis had a notable impact on their quality of life. Also, among the HSV-2 positive people, lower GHQOL at the 3 month follow up was predicted by higher interpersonal sensitivity ($r=-0.44$, $p<0.05$), lower social support ($r=0.40$, $p<0.05$), and quality of sex ($r=0.62$, $p<0.01$) at baseline.

Conclusions: A diagnosis of asymptomatic HSV-2 infection does not appear to cause significant lasting psychological difficulties. Those for whom the diagnosis had the greatest impact were interpersonally vulnerable before the diagnosis. These results suggest that assessment of interpersonal distress may be important to include as part of pretest and post-test counselling.

The majority of people who are seropositive for herpes simplex virus type 2 (HSV-2) do not report a history of symptoms or an awareness that they are infected,[1] yet, they can still transmit the infection.[2] With the recent availability of herpes type specific serological screening tests, professionals have struggled with whom and in what setting individuals should be screened,[3–8] including whether screening should become a routine part of sexually transmitted disease (STD) screening in public and private settings. Given that suppressive antiviral treatment and condoms both reduce the risk of HSV-2 transmission, there are clear potential benefits of individuals knowing their serostatus.[9 10] On the other hand, serological testing could have a negative emotional impact of an HSV-2 diagnosis, which would outweigh the benefits.[7]

Relatively few studies have systematically examined the psychological impact of a positive HSV-2 serology in adults with no known history of genital herpes. Although vaccine trials have diagnosed many asymptomatic infections, data are not currently available about the impact of the diagnosis for those individuals. Five recent studies reported no substantial psychological morbidity after HSV-2 diagnosis,[11-15] although there is some evidence that a positive result can lead to transient negative psychosocial reactions (for example, confusion and distress), concerns about the implications for romantic relationships, and fear of transmitting the virus.[13 14] In this study, we measured a wide range of psychosocial issues potentially associated with reactions to HSV-2 diagnosis, including social adaptation, relationship factors, herpes quality of life, and the more traditional measures of psychological symptomatology (for example, depression and anxiety). In addition, our research included participants recruited from a variety of settings.

The present study had three aims. Firstly, we evaluated the impact of a positive serological test on psychosocial functioning at 3 months post-diagnosis. Secondly, we assessed genital herpes quality of life at 3 months. Finally, we evaluated whether functioning before diagnosis predicted subsequent herpes health related quality of life.

METHODS

Study population and procedure

Participants were recruited from four sites: an STD clinic and two primary care medical clinics (treated as one site for analysis) in Indianapolis, Indiana, and an adolescent health clinic and a college student population in Cincinnati, Ohio. These sites were chosen to represent a range of ages and level of risk for sexually transmitted infections. The STD and adult medical clinics serve urban and suburban neighbourhoods within the city of Indianapolis. The catchment area for the adolescent clinic is the greater Cincinnati area, and the college draws students from Cincinnati, other parts of Ohio, and nationally. Details about these study sites have been previously reported.[16] In the adult sites, participants were 18–30 years of age, whereas the adolescents ranged in age from 14–20 years. At the Indianapolis sites, potential participants were recruited from clinic waiting rooms. At the Cincinnati adolescent health clinic, healthcare providers identified potential subjects through clinic records and through a ''snowball'' recruitment technique in which adolescents who

Abbreviations: ANOVA, analysis of variance; BSI, Brief Symptom Inventory; GHQOL, genital herpes quality of life; HRQOL, herpes health related quality of life; HSV, herpes simplex virus; MSPSS, Multidimensional Scale of Perceived Social Support; STD, sexually transmitted diseases

Table 1 Description of sample

Measure	Baseline		3 Month follow up	
	Negative (n = 60)	Positive (n = 33)	Negative (n = 60)	Positive (n = 33)
Age*	21.8 (3.6)	24.2 (3.6)		
% Female	87%	88%		
% White	52%	48%		
Site				
% STD clinic	50%	46%		
% Adult clinic	30%	33%		
% University	13%	15%		
% Adolescent	7%	6%		
BSI scales*†				
Depression	1.60 (0.80)	1.76 (0.80)	1.49 (0.71)	1.78 (0.86)
Anxiety	1.49 (0.65)	1.65 (0.68)	1.44 (0.73)	1.64 (0.76)
Hostility	1.63 (0.70)	1.74 (0.87)	1.54 (0.67)	1.63 (0.69)
Paranoia	1.73 (0.74)	1.88 (0.80)	1.64 (0.76)	1.96 (0.81)
Interpersonal sensitivity	1.69 (0.81)	1.70 (0.84)	1.63 (0.80)	1.80 (0.98)
Social support*†	4.25 (0.70)	4.00 (1.01)	4.18 (0.67)	3.97 (0.71)
Relationship quality*†	4.33 (0.78)	4.01 (1.09)	4.31 (0.91)	4.23 (0.86)
STD related stigma*†	1.41 (1.73)	1.75 (2.00)	1.33 (1.78)	1.45 (1.42)
Quality of sex*†	4.07 (0.82)	4.11 (0.82)	4.15 (0.75)	4.13 (0.75)

*Values expressed as mean (SD).
†No significant differences between groups on any measures.

participated identified other potential participants. College students were recruited through advertisements. Eligibility criteria included no known history of genital herpes and the ability to read English. All subjects (and guardians for those under 18 years) provided informed consent for participation by signing a form that was approved by both local institutional review boards and the Centers for Disease Control and Prevention's institutional review board.

We used a two step consent process in which subjects were first recruited to complete a written questionnaire. Indianapolis participants were compensated $15 for questionnaire completion. Given that Cincinnati subjects were not recruited from clinic waiting rooms, they were compensated $20 to account for the additional time and effort required for participation. Step two of the consent process involved the offer to all subjects of a free blood test for detection of HSV-2 antibody. Those under 18 years had to have parental consent for the serological screening. No additional compensation was provided to those subjects who agreed to undergo testing.

Individuals who chose to be tested for HSV-2 returned in 2 weeks for their results. Participants who were positive and a subset of those who were negative were asked to come back in 3 months for a follow up questionnaire. At all sites, those who returned to complete questionnaires at the 3 month follow up appointment were compensated $20 for their time and effort.

Measures

The questionnaire assessed sociodemographic characteristics and included multiple psychosocial measures, described below. With the exception of the herpes health related quality of life (HRQOL) measure, all scales were administered at baseline and at the 3 month follow up appointment. The herpes HRQOL was only administered at follow up to those who were HSV-2 positive.

General psychological adjustment was measured with the following subscales from the Brief Symptom Inventory (BSI): depression, anxiety, paranoia, hostility, and interpersonal sensitivity (that is, feelings getting easily hurt).[17] The BSI is an instrument with demonstrated reliability and validity, which asks respondents to indicate how much a problem has bothered them in the past 7 days, ranging from ''Not at all'' to ''Extremely.'' In our sample the five subscales demonstrated good internal reliability (coefficient alphas ranging from 0.74 to 0.88).

Perceived social support was evaluated with a six item measure derived from the 12 item Multidimensional Scale of Perceived Social Support (MSPSS; alpha = 0.87).[18] The MSPSS evaluates an individual's perception of interpersonal support from three sources: family, friends, and a significant other. Participants responded to each item using a five point response scale ranging from ''Strongly disagree'' to ''Strongly agree.'' The score was calculated as the mean value across the six items, with higher scores indicative of greater perceived social support.

Relationship quality was evaluated with a five item measure that has been used in several previous research projects (alpha = 0.94).[19 20] This scale, which used a five point response scale, measured the degree of emotional closeness and affiliation experienced in the individual's primary identified romantic relationship. The score was calculated as the mean value across the five items, with higher scores indicative of better relationship quality.

STD related stigma was measured with an 11 item true-false scale adapted from an established measure (alpha = 0.69).[21] A total stigma score was calculated by summing across the items so that a higher score was indicative of greater feelings of stigma associated with an STD examination or diagnosis.

Perceived quality of sex was measured with seven items (alpha = 0.96) and was developed for this project. Participants answered each item with a five point response scale ranging from ''Strongly disagree'' to ''Strongly agree.'' Quality of sex scale scores were calculated as the mean value across the seven items, with a higher score indicative of higher quality of sex.

Genital herpes HRQOL is a 20 item measure for which reliability, content, and construct validity have been previously established.[22] It addresses issues such as feelings of shame associated with having herpes and herpes making life difficult (alpha = 0.95).[22] Participants responded to each item using a four point response. The stem for each response was variable (for example, difficult or worry) but always ranged from ''very'' to ''not at all.'' A total herpes HRQOL score was calculated by summing across items, with a higher score indicative of a better HRQOL and fewer problems with herpes. For purposes of individual item analysis, answers of

Table 2 Genital herpes health related quality of life (HRQOL): most and least endorsed items

Most endorsed items	% Endorsed as "very" or "quite"
It is difficult to forget that I have herpes	63%
I worry about giving herpes to someone	56%
I worry about people I know finding out I have herpes	48%
I feel insecure about personal (intimate) relationships because of herpes	30%
I get depressed about having herpes	30%
I feel angry about having herpes	30%
I worry that people will reject me if they know I have herpes	30%
Least endorsed items	**% Endorsing as "very" or "quite"**
Herpes is affecting my sex life	15%
Because of herpes, I become tense when someone touches me	15%
I find it difficult to live with herpes	11%
Herpes makes it difficult for me to plan ahead	7%
I feel isolated from other people because of herpes	7%
Herpes is making my life miserable	4%

"very" or "quite" were considered to be indicative of endorsing the experience.

Statistical methods

To evaluate the first specific aim, we used a 2×2 repeated measures analysis of variance (ANOVA) to compare psychosocial adjustment between HSV-2 positive and HSV-2 negative people from baseline to 3 month follow up. The within subject factor was time (baseline; 3 months) and the between subject factor was diagnostic group (HSV-2 positive; HSV-2 negative). Dependent variables were the BSI subscales, perceived social support, relationship quality, STD related stigma, and quality of sex.

The second set of analyses involved an examination of genital herpes HRQOL among those who had tested positive for HSV-2 by calculating the percentage of individuals who endorsed each item. Pearson product moment correlations were used to evaluate the relation of HRQOL to potential baseline predictors and current level of functioning (specific aim 3).

RESULTS

There were 1199 sexually experienced subjects enrolled in the study, of whom 820 (68%) accepted HSV-2 serological screening. Of those

820 participants, 149 (18%) were positive, ranging from 7% positives among the adolescents to 26% among the STD clinic patients. Overall, 72% returned for their results; 62% of the HSV-2 positive ($n = 93$) and 74% of the HSV-2 negative returned ($n = 496$). Thirty three of the HSV-2 positive individuals returned for 3 month follow up (four did not recall their diagnosis). At each site, following a positive result, the next two negative subjects at that site were asked to return for a follow up visit in 3 months; 121 HSV-2 negative individuals returned for 3 month follow up. The HSV-2 negatives were matched nearly 2 to 1 to the 33 HSV-2 positive within recruitment site based on gender and race (white/non-white). The 60 HSV-2 negative individuals included in the analyses were more likely to be female ($p>0.01$) and non-white ($p<0.01$) than the 61 HSV-2 negative individuals who were excluded. This set of findings is a natural outcome of the process of matching negative to positive participants. The included and excluded groups were not significantly different on any baseline or follow up measures, with the exception of STD stigma at 3 months, in which the excluded group had higher scores (mean = 2.3) than the included group (mean = 1.3, $p<0.05$). (See table 1 for descriptive data on the HSV-2 positive and included negative samples at baseline.)

Nine repeated measures ANOVAs were carried out to compare those who were diagnosed as HSV-2 positive with those who were negative with regard to depression, anxiety, paranoia, hostility, interpersonal sensitivity and STD related stigma, and levels of social support, relationship quality, and quality of sex at 3 months post-diagnosis. There were no statistically significant main effects for time or for diagnostic group. Of specific relevance to questions about the impact of a genital herpes diagnosis, there also were no statistically significant time by group interaction effects. (See table 1 for the mean values of the dependent measures at baseline and 3 month follow up.)

The four individuals who did not recall their HSV-2 diagnosis were not included in the analyses involving the genital herpes HRQOL, as it was not relevant to them. Although the analyses above indicated no significant negative impact of the HSV-2 diagnosis on psychosocial functioning, a number of individual HRQOL items were endorsed frequently as being either quite or very difficult problems, including "It is difficult to forget that I have herpes" (endorsed by 63%) and "I worry about giving herpes to someone" (endorsed by 56%). Table 2 lists the most frequently endorsed items (30% or more) and the least frequently endorsed items (15% or less).

Greater baseline interpersonal sensitivity ($r = -0.44$, $p<0.05$), lower sexual satisfaction ($r = 0.62$, $p<0.01$), and lower social support ($r = 0.40$, $p<0.05$) were associated with poorer HRQOL at 3 month follow up. Lower baseline relationship quality was similarly associated with poorer HRQOL ($r = 0.41$, $p = 0.07$), but this correlation may not have been statistically significant because of missing data. Baseline measures of depression, anxiety, hostility, paranoia, and STD related stigma were not statistically significant predictors of HRQOL ($p = 0.47$ to $p = 0.13$).

DISCUSSION

Until recently, little research has been conducted on the psychological sequelae of a genital herpes diagnosis. Care providers' impressions are often based on those few patients who are quite distressed or very demanding of the care provider's time. In addition, the impact of an asymptomatic infection may be different from that of a symptomatic infection. It has been suggested that the recurrences themselves may be associated with altered mood states, and that the pain and discomfort of the disease may be an important aspect of the psychological stress.[23] Thus, it is important to examine the psychological impact of asymptomatic infections independently from the impact on those individuals with clinical disease.

The finding that there was no sustained impact on psychological adjustment at 3 months supports previous findings.[11–15] However, many individuals did report an impact on their quality of life specific to herpes, particularly those who were more interpersonally distressed before screening, a finding consistent with a study that demonstrated general psychosocial functioning was related to the impact of an STI diagnosis on adolescents, not the particular STI.[24] Therefore, individuals who are already vulnerable with regard to their sexual and interpersonal experiences appear to be most impacted by an HSV diagnosis. While the most vulnerable individuals had the greatest psychological difficulties, many of the participants experienced quality of life problems specific to herpes. The more frequently endorsed items appeared to be focused on the emotional associations with being infected (for example, shame, depression, anger), and

Key messages

- There was little sustained psychological distress among those who were diagnosed with asymptomatic HSV-2 infection
- The diagnosis may have some specific herpes quality of life impacts such as worries about transmission or of others learning of the diagnosis
- Psychologically vulnerable individuals were at the most risk for an impact on herpes specific quality of life

on interpersonal consequences such as having to tell others or rejection. These findings highlight the importance of anticipating and addressing concerns of patients newly diagnosed with herpes or HSV-2 infection.

The results of this study should be interpreted in the context of the limited ethnic and regional diversity, and the limited ability to examine gender differences. In addition, when considering implementing screening programmes, it is important to note that there was a high loss to follow up between the testing and the time results were provided (30% loss overall and 37% loss among those that were HSV-2 positive). The fact that these individuals did not find out about their test results may be related to the fact that testing was not being done as part of a clinical examination or in response to symptoms. The availability of a point of care test would change the need for follow up appointments and, thus, more individuals might learn of their results. There was an additional loss to follow up between the individuals learning of their positive results and the 3 month follow up assessment (64%). This may represent those who were too distressed to return, but it is also likely that it represents those who did not find the results significant enough to warrant a return visit. Understanding these two points of loss to follow up will be important for interventions that are planning to use screening as a tool to foster behavioural change.

This study points to the importance of understanding the psychological impact of herpes infections in the context of pre-morbid functioning. Without baseline assessments, it is possible that the individuals for whom there is the most impact would not be identified. The major impact was on quality of life specific to herpes; thus, future research could assess specific interventions that might reduce the extent of this distress. Finally, this and other studies do not support the notion that herpes screening programmes should not be implemented because of the psychological costs to individuals. Other reasons such as the cost of the screening and the sensitivity/specificity of the test in particular populations should continue to be considered.

CONTRIBUTORS

SLR, GDZ, JSL, LRS, KHF, DIB participated in the design and conceptualization of the project; WT and GDZ analysed the data; SLR and GDZ wrote the initial manuscript; and all authors provided substantive edits to the final version of the manuscript.

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COMMENTARY

The perception that both condom usage and antivirals can potentially modify the risk of transmission has led some to advocate the routine screening of asymptomatic individuals. One barrier to wider screening is the possibility of causing psychological harm to those who are asymptomatically infected. Rosenthal *et al*[1] found no evidence that discovering they were positive led to frank psychiatric symptoms in most of their positive individuals. This is reassuring. However, the authors point out that the positive individuals did report some adverse psychological effects. Many reported, for instance, that they were preoccupied with the disease or that herpes made them depressed. This discrepancy raises the important issue of what should be considered a significant adverse psychological impact.