Acceptability of a Dapivirine Vaginal Ring among US Adolescent Females In a Phase 2a Safety Trial (MTN 023/IPM 030)

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Background

- Modest risk reduction against HIV-1 infection for women over age 25 in sub-Saharan Africa has been reported in recent Phase III trials of a vaginal ring (VR) continuously releasing the antiretroviral drug dapivirine.
- No risk reduction was found for women under 21 years likely due to poorer adherence.
- MTN 023/IPM 030 is collaboration between the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), the International Partnership for Microbicides (IPM), and the Microbicide Trials Network (MTN).
- The ring has been found to be safe and acceptable by standard self-report questionnaires in this trial [1].
- Qualitative research expands on the acceptability of the ring in this population

Methods

MTN 023 Methods:

- Ninety-six adolescents (15-17 years old) were enrolled in a Phase 2a randomized placebo-controlled safety trial of the Dapivirine VR; first enrollment was July 9 2014 and last follow up July 5 2016. Participants were enrolled at five U.S. sites (Birmingham (n=3), Boston (n=4), NYC (Bronx) (n=4), Denver (n=6), and Pittsburgh(n=4)) and recruited from adolescent and primary care health clinics, family planning clinics, gynecology clinics, and community-based locations.
- Study participants self-inserted a VR at the initial study visit, and at each subsequent monthly clinic visit when a new VR was dispensed. They attended clinic visits every four weeks, to week 24, and received a new VR at each clinic visit until week 24 when the VR was removed and no new VR inserted..
- A subset of 21 were randomly selected for in-depth semi-structured interviews (IDI) at their final clinic visit.
- Participants used the VR for either 12 (n=5) or 24 weeks (n=16).
- Trained interviewers conducted visual web-interviews at week 25.
- Open-ended questions examined participant overall experiences and feelings using the VR, and participant reports of partner attitudes and experiences with the ring, including during sexual intercourse.
- Interviews were digitally recorded, transcribed verbatim, entered into Atlas TI, and analyzed using thematic content analysis based on the conceptual model of acceptability and adherence shown in Figure 1.
- Verbatim quotations illustrative of each theme are in the tables, with quotes from each site for each theme.

Results

Figure 1: Conceptual model for VR use experiences predicting product acceptability and adherence; adapted from the Comprehensive and Flexible Conceptual Framework

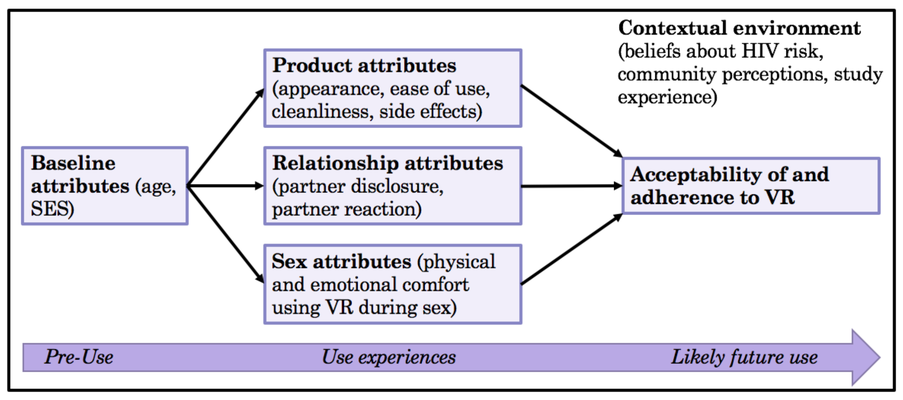

Table 1: Demographics of IDI Participants (n=21)

Characteristics	Age (mean/median)	Hispanic % (n)	Black % (n)	White % (n)	On Davivirine ring % (n)
All	17.3/17.6	19% (4)	52% (11)	42% (9/21)	81% (17)

Table 2: Perceived partnership, sex, and product related facilitators to VR acceptability and adherence

Recurrent Themes	Sample Quotations	Participant ID
Partnership factors		
Deciding to disclose VR use to partners	"I told a few of my family members and my boyfriend."	Boston317-30006
	"I told my boyfriend."	Boston317-30001
	"[I told] my mom and my partner."	Bronx328-00009
	"[I told] my mom, my sex partner, and my sister."	Bronx328-00005
	"[I told] people that's close to me: my mom, my dad, my boyfriend, a few of my friends."	Bronx328-00013
	"[I told] my mother, and my partner… I told my partner because I knew we would have sexual relations, so I had it inside me, so it would be difficult not to."	Col327-00001
	"[I told] just my mom and my boyfriend."	Col327-00008
	"I've told my boyfriend, both my parents, and a couple of friends of mine."	Col327-00009
	"I told… my boyfriend… because we were sexually active a little bit. So it was like, I should share with him anything that goes on with my body."	Pitt335-10019
	"I told my boyfriend, and my mom knows about it."	Pitt335-10008
	"[I told my] caregiver and sex partner."	UAB315-80006
	"[I told] my boyfriend, my dad, and mom, and my two best friends."	Col327-00002
	"[I told] my partner, so the person I'm with, and then… my mom, and then my siblings knew too."	Col327-00004
	"[I told] my boyfriend, my father, cause he's the only family I have any more. Um, and then just a couple of really, really close friends."	Col327-00006
Positive reaction to VR use from partners	"[My partner] asked what it was. But I explained it to him and it didn't seem to bother him."	Col327-00008
	"The way they reacted was generally positive, they just wanted to make sure that I was safe… but they were totally fine with me doing what I wanted to do."	Col327-00006
	"Well they didn't really mind. Because it wasn't them. They support me in anything."	Bronx328-00009
	"… My boyfriend would do it for me. He would go wash it off and put it back."	Bronx328-00013
	"My boyfriend was curious as to like what it looks like and I wanted to show it to him so that he would understand."	Col327-00009
	"My sex partner, he was very supportive of it too. He actually thought it was a great idea and he thought very highly of the study."	Col327-00009
	"It didn't really bother them, they were all okay with it."	Pitt335-10003
	"And my boyfriend, he just wanted to know a little bit more about it… [he was] fine with it."	Pitt335-10008
	"Well my boyfriend likes the ring more than using a condom."	Col327-00002
	"He was very supportive… like I was already on the Nuva ring, so he knew about that too, so really was not much of a difference."	Col327-00004
	"He's supportive… I had the same partner the entire study, and he's glad I'm doing this, trying to help other, uh, women. He'll have sex if I want and if not it's my decision. I usually take it out, but he's totally fine with me having it."	Col327-00006
Sex factors		
Emotional comfort with VR use during sex	"I liked that it didn't make me feel uncomfortable. That any time I have sex… my partner didn't feel it…"	Bronx328-00013
	"At first I was like 'Is he going to feel it, like how is it going to feel?' but then once I did have intercourse everything was okay, he didn't even feel it."	Boston317-30001
	"It didn't make me feel uncomfortable or nothing."	UAB315-80004
Physical comfort with VR use during sex	"[What I liked most about the ring was that] it didn't bother me during sex."	Col327-00008
	"Any time I have sex… my partner didn't feel it unless he like, um had to put it back in or something."	Bronx328-00013
	"[My boyfriend] said he doesn't feel it when we have intercourse and he doesn't actually really know it's there."	Col327-00009
	"My boyfriend didn't even notice it. Like he felt it, but it didn't bother him he said."	Pitt335-10008
	"[My boyfriend] didn't feel it I don't think. And it didn't… make me feel uncomfortable or nothing."	UAB315-80004
Product factors		
Inability to feel VR/comfort of VR inside body	"What I liked most about the ring was that you can't feel it."	Boston317-30006
	"… It didn't move around at all, and then I couldn't even tell it was really up there most of the time, so I mostly just forgot about it, so that was really the most beneficial thing that came out of it."	Col327-00004
	"Well I liked that it didn't move so it wasn't uncomfortable, it always stayed in like the same place for the most part."	Col327-00008
	"I liked the fact that it doesn't come out… it doesn't feel out of place, and it doesn't make me feel uncomfortable."	UAB315-80004
	"The ring like you can't even tell it's there… Well I liked that it didn't move so it wasn't uncomfortable, it always stayed in like the same place for the most part."	Col327-00008
	"I think once I realized that it's actually very comfortable and very easy to use my initial shock kind of went down… I actually don't feel it at all… I liked how comfortable it fit."	Col327-00009
	"I didn't really notice it when it was already in. It didn't bother me or anything."	Pitt335-10003
	"While I was wearing it, it was very comfortable. I couldn't feel it at all."	UAB315-80005
	"It's comfortable when you get it in all the way."	Col327-00006
Ease of use	"Hmm, it's pretty easy, I guess, it's like not very, not a lot of work or anything to do."	Boston317-30003
	"I like that it's easy to put in."	Bronx328-00009
	"I like how simple it is, because when you're using like birth control you have to take a shot over a certain period of time or take a pill and remember what time to take it at, but with the ring you just put it in and you can take it out too, it's not like a pill where you eat it and you can't take it out again. If you want options."	Col327-00006
	"I thought it was very easy to use and get used to."	Pitt335-10007
	"When I actually inserted it, it was easy then you just forget you have it."	Boston317-30006
	"I like that it's easy to put in."	Bronx328-00009
	"Well it was easy inserting it as well as taking it out."	Bronx328-00005
	"It was easy to put in and take out."	Pitt335-10003
	"It was easy to insert when it was time to you know change it… it was very easy… It was so easy. I didn't expect it to be that easy."	Pitt335-10007
	"I think once I realized that it's actually very comfortable and very easy to use my initial shock kind of went down."	Col327-00009
Lack of interference with daily activities	"Well I can't feel it when you're going about your business… I thought I might be able to feel it like when I run and stuff cause I do a few races and I do a lot of like training… But I can't feel it… I like that."	Boston317-30006
	"Like when I was doing certain activities I couldn't feel it at all. Like I was, I have to do a lot of bending. I didn't feel it, it never came out."	Bronx328-00005
	"I liked that it didn't really like, bother me that much. Because like, for sports and stuff like that it was okay to keep in."	Pitt335-10003
	"I liked the fact that you didn't like, feel it, like as you were walking around and I was cheerleading, so I didn't even feel it with me cheerleading."	Pitt335-10019
	"I liked that it didn't slip out when I used the bathroom or anything."	Pitt335-10008
	"It was very easy um, I didn't feel it during any activities."	Pitt335-10007
	"It doesn't bother me, I can still move around, and do what I do daily."	Boston317-30001
	"I couldn't feel it. Unless it was going in or coming out, I don't feel it. Like, it doesn't interefere with my daily activities."	UAB315-80004
Preference of VR over condoms	"[I would prefer to use] a ring."	Boston317-30001
	"If, like me, the person doesn't really feel the ring, in day to day activities, and is like comfortable with it being in, I say the ring is better… for HIV prevention."	Boston317-30003
	"I think the ring would feel more natural because if you wear a ring then you wouldn't have to wear a condom. So it would feel more natural… [I prefer] the ring because it's more comfortable, and then I wouldn't have to worry about every time I have sex to put a different condom on. Like it's already there."	Bronx328-00005
	"I only used condoms before. And, I felt like, it was better than using condoms because you don't have to feel the rubber… I like the ring better."	Bronx328-00013
	"It's better than a condom because a condom you have to do it every single time that you do it."	Col327-00001
	"Well, um, I think without the condom it's more pleasurable for the guy… [I prefer] the ring… cause the ring stays in there, and you don't have to worry about the condom tearing or stuff like that."	Col327-00008
	"I think [other women] might like [the ring] more than like male condoms and stuff. And I think they would like, want to use it… I would actually say the ring is like more discreet than the condom."	Pitt335-10003
	"I would prefer the ring, but I will also still use both."	Pitt335-10019
	"Like the ring… feels better. Like, it's like no problem. It's in there and it's not going to come out."	UAB315-80004
	"… the ring doesn't have a smell. The condom has a smell. It's like, you know, the rubber smell?... But the ring doesn't have a smell. So like, the ring is better to me."	UAB315-80004
	"[I prefer] a ring… I would just say [the ring is] safer, but you know there's the possibility of the condom breaking, and with the ring you wouldn't have to worry about that."	UAB315-80005
	"You can, um you can forget condoms, you can forget the diaphragm, but the ring is in you thirty days. So it's more, it's more reliable than condoms because it stays there. It's not coming in and out."	UAB315-80006

Table 3: Perceived partnership, sex, and product related barriers to VR acceptability and adherence

Recurrent Themes		Participant ID
Partnership factors		
Deciding not to disclose VR use to partner(s)	"The one person I thought might have something negative to say, I just didn't tell."	Boston317-30003
	"It was just like sometimes embarrassing, I would like, sneakily try and take it out… it was just like… an awkward thing to bring up because people don't really know about it."	Boston317-30003
Negative reaction from partner(s)	"He was basically worried about if I could get HIV from using it."	
	"My sex partner wasn't really okay with it. He had some questions about it… He was basically worried about if I could get HIV from using it… He doesn't really like the ring."	UAB315-80005
	"Um what I didn't like probably was like, insecure with having relations, but then like it wasn't an issue for me… it was just my partner… he just felt like weird."	Col327-00001
Sex factors		
Emotional discomfort with VR use during sex	"I wasn't like embarrassed, just like, I was anxious, I'm like what if they don't like it, what if they feel it's there, oh my god, what's this, why."	Boston317-30006
	"I didn't want to have sex. I don't like sex with this ring."	Bronx328-00009
	"Um, it made me not wanna have sex… Because, um, it's weird. I feel like that's weird."	Bronx328-00003
	"Um what I didn't like probably was like, insecure with having relations, but then like it wasn't an issue for me… it was just my partner… he just felt like weird."	Col327-00001
	"[I dislike that] your partner is able to feel it during sex."	Bronx328-00009
	"And when we were having sex and [my partner] would feel it… he knew it was the ring. But, he didn't really mind. I was the one that was upset about it."	Bronx328-00009
	"[I was] a little embarrassed [during sex]."	Col327-00001
Physical discomfort/interference with VR use during sex	"When I got the ring there would be some weeks when we wouldn't have [sex] cause I was feeling raw or uncomfortable down there."	Col327-00006
	"During sex it's not the best feeling, I don't know, it's kind of uncomfortable."	Boston317-30006
	"Like having sex… it was like, a little bit in the way. So, I would sometimes take it out, before."	Boston317-30003
	"It just like, made it, it was just like, felt like, odd, like extra like tight… it was just like more uncomfortable, and like harder, I guess."	Boston317-30003
	"I usually have some pain during sex… which is why it was an issue that the ring made it feel tighter."	Boston317-30003
	"[I would have liked to stop using the ring] maybe just during sex."	Boston317-30005
	"It didn't really affect [sex] but my sex partner told me that he felt it, like every time."	Bronx328-00005
	"Well, I took it out before I had sex because it felt kinda weird."	Col327-00001
Product factors		
Concerns with size and rigidity of VR	"I thought it was gonna be thinner."	Boston317-30009
	"I thought it was like a big ring."	Boston317-30009
	"It was very thick and really stiff."	Boston317-30005
	"It was bigger than what I imagined."	Bronx328-00005
	"I thought it was really big. I thought it wasn't going to fit."	Bronx328-00013
	"I was shocked because of how big it was."	Col327-00001
	"I thought it was really thick, like it was surprisingly thick. Um, and it was very large. I think that it was thick and large."	Col327-00009
	"It was like hard, and I like expected it to be softer than it was."	Boston317-30003
	"When I saw it, I thought I would feel it inside me."	Pitt335-10019
	"I thought it was a little bit thick, and I didn't really understand how it would go in."	Pitt335-10007
	"It was big. Kind of big, wide."	UAB315-80006
	"When I first saw it, it was big, uh, because I've seen the birth control rings and they are a lot thinner and I was a little bit intimidated by the size."	Col327-00006
Concerns and/or discomfort with using the VR during menstruation	"I feel like that's kind of gross, to have like, blood on the ring."	Boston317-30003
	"I was a little worried at first like, that it would be like dirty because you're not changing it."	
	"The part that I disliked about the ring was when I would have my monthly cycle it would sometimes keep the blood in me and once you take the ring out, it would, you know…."	UAB315-80005
	"I'd be having my period while I had the ring in… and… I could just assume that it was probably gross, so I just cleaned it out when I was in the shower."	Col327-00002
	"When I was on my period, I had to use tampons, and, I don't know, it wasn't really comfortable with the ring inside, it made it, it was weird, it was uncomfortable."	Boston327-30006
	"… A tampon and the ring, it would probably be more uncomfortable too. 'Cause tampons is uncomfortable by theyselves."	UAB315-80006
	"During the study they said it was better not to use tampons when I was on my period, so that really was the only thing that kind of frustrated me."	Col327-00004
	"I think it would definitely interfere with like tampons in the vagina, because there's already a ring up there… when you're on your period for example, you don't wanna have to pull the ring out."	Col327-00006
Problems with ring insertion	"I noticed when I'd get myself, I don't know, ready to first put the ring in… it's harder, it's like hard, it has to soften up so it's not really fun to put in."	Boston317-30006
	"Sometimes like when you hold it to put it in and it's like uncomfortable because when you first get it it's more hard."	Boston317-30006
	"I never really got the hang of like how to put it in right."	Boston317-30006
	"It's just difficult to insert, uh it's just really rigid. So it's kind of harder to put it in."	Col327-00009
	"I didn't like how difficult it was to put in. Because it was very, very difficult."	Col327-00009
	"[I disliked] trying to get it in. The feeling of trying to force it in."	UAB315-80004
	"[After the ring fell out] I tried to put it back in, but I definitely did it wrong and it hurt."	Boston317-30005
	"It's kind of hard to [insert] on my own."	UAB315-80004
	"[Insertion] is kind of painful."	UAB315-80005
	"It can be difficult [to insert] when you're like in the shower, you try to clean it off or something like that, and it's already slippery…"	Col327-00002
Pain or discomfort when VR was inside body	"Well the only thing is once in a while when it moved that's when it was really uncomfortable."	Col327-00008
	"When I was working out, it was like pulling or pushing."	Col327-00001
	"When I was at school… I don't know it would move and then there was no place to like really fix the ring."	Col327-00008
	"Well the only thing is once in a while when it moved that's when it was really uncomfortable."	Col327-00008
Unwanted expulsion of the VR	"[I dislike] that it came out."	Bronx328-00013
	"I think the only problem that really kind of freaked out me and my boyfriend was it coming out, and like, that just kind of freaked him out, cause he didn't think that could happen."	Col327-00002
	"There was one time it came out in the shower."	Boston317-30005
	"[The ring came out by itself] one time… [when I was] urinating after sex."	Bronx328-00009
	"It came out about five times [during sexual intercourse]."	Bronx328-00013
	"It fell out once… I think it was during my period."	Col327-00008
	"It came out once when we were having sex."	Col327-00002
Perceived side effects	"Um, well I feel like it was giving me discharge…Odor and discharge. Those were the only bad things about it."	Bronx328-00009
	"I think my side effect was discharge, but nothing major."	UAB315-80006
	"I had a lot more discharge when I used the ring."	Col327-00002
	"I stopped for my last… visit because… my skin was starting to get irritated."	Col327-00004
	"Every time I went in to the clinic for the new ring… the first week or two of having that new ring it would make me feel a little bit raw… in the beginning the ring would cause a little bit of pain."	Col327-00006
	"When I was using the ring I would have cramps every once in a while."	Col327-00001
	"There were some times before I had all that going on with the ring, when I was just, I was pretty emotional, like, I just felt really sad for no reason."	Col327-00006

Conclusions

High acceptability of VR as a HIV prevention method for US adolescent females was reported. Although initial concerns about size and other physical characteristics of the ring may have diminished with use, participants did not explicitly report a change in their opinions about product size and other characteristics. Principal concerns for young women are partners' feeling the ring during sex and menstrual hygiene issues – these may be managed proactively by clinic staff to help increase acceptability and adherence.

1. Bunge K et al. Safety and acceptability trial of the dapivirine vaginal ring in U.S. adolescents). IAS 2017 Abstract #TUAC0206LB

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