national vvf project nigeria

evaluation report II

1992

reprint

Babbar Ruga Fistula Hospital
KATSINA

and

Laure Fistula Center
KANO

by

Kees WAALDIJK

reprint

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national vvf project nigeria

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VVF-projects

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second evaluation report

VVF-projects KANO and KATSINA

introduction

With an incidence rate of 2 per 1,000 deliveries and a prevalence of some 150,000 VVF-girls/women in the whole of Nigeria, it was high time something was done on a larger scale.
As it is a typical major public health problem of a developing country it can only be solved within the existing health structure of Nigeria.
Project documents were prepared with long-term and short-term objectives, a 5-yr plan of activities, a field research, a database and an intensive training programme for Nigerian doctors.
Special care was taken to keep it simple, sound, effective, payable and also feasible; all without loss of quality.

long-term objective

As the obstetric fistula can only be prevented by a cesarean section within 3 hours from the moment labor has become obstructed, a network of 800 obstetric units have to be set up for Northern Nigeria each serving an area of 750 sq km to have a proper coverage of the 600,000 sq km.

short-term objectives

KATSINA

The operation theater has been upgraded, but a separate sterilizing room and a scrubbing area are planned to ensure good sterility. This can be done within the existing facilities under a low budget.
From the only operation table the hydraulic system has broken down, and a replacement is needed.
It is high time to provide the hospital with a good and reliable running water supply in stead of getting the water by hand from the well. Many plans have been made, but all to no avail.
There is more or less an equilibrium between the input and output of the patients.

KANO

The number of patients are increasing almost daily. To illustrate the extent of the problem, 81 patients were seen during 1992 coming from within KANO city, N.B. where there are many hospitals and health centers.

Of the two available 'operation tables', only one is 'functioning' with a lot of difficulties.
Urgently the number of postoperative beds have to be increased to at least 40 to double the amount of operations.
Also the hostel has become far too small to cope with all the patients.
There are far more patients coming to Laure Fistula Center than within the present facilities can be operated.
In both centers two hydraulic operation tables are urgently needed. In KANO an effort has to be made to increase the number of postoperative beds and to extend the hostel.

training

There are two training programmes which are run simultaneously, one for general doctors with a surgical experience of at least 3 years and one for senior registrars in obstetrics and gynecology.
Also consultants are visiting both centers to become more familiar with VVF-surgery.
In line with the training most of the trainees have started their own VVF-clinic after finishing the training course, and I wish them all the best of luck.
A list of all those doctors is presented in Annex I.

training curriculum

We are still busy to prepare a short written checklist covering all the aspects of the VVF and its surgical management, what is a VVF, the incidence, the prevalence, the preoperative preparation, the classification and the consequences for operation technic and prognosis, the postoperative care, instructions for further deliveries etc.

activities

During 1992, a total of 938 VVF/RVF-repairs and related opereations have been performed, viz. 563 in KATSINA and 375 in KANO (see Annex II).
However, this is by far not sufficent as some 200-300 patients are still on the waiting list for surgery.

field research

The database is growing steadily, and gives a good insight into the epidemiologic parameters in Northern Nigeria; for instance, for the age of the patient at which the fistula developed see Annexes.
An effort has been made to bring the surgical management back to simple surgically sound principles as there is no place yet for high-tech in the developing countries.

It is a two-man job: the surgeon and an instrumentating nurse. Almost all surgery can be done vaginally with the patient in the exaggerated lithotomy position with a self-retaining AUVARD speculum; two retractors inside the vagina is already a crowd.
A further development of the immediate repair of fresh obstetric fistula, called primary suturing by the staff, seems to be a breakthrough in the treatment of obstetric fistula with a success rate of over 90%. It is relatively simple to perform, reduces the waiting period, most of the time does not need major anesthesia (only if it is too complicated or the patient not cooperative major anesthesia is needed) and can be done immediately the slough has disappeared, whatever the condition of the patient. Theoretically, it falls within the time of the physiologic wound healing processes. Most of the time, the patient comes walking into the operation theater and after 20-25 min leaves it walking as well! It has become the standard (outpatient) treatment of patients leaking less than 3 mth. The only problem seems to be that one has to be an expert vaginal surgeon.
All the different operation technics have been laid down in "step-by step surgery of vesicovaginal fistula; a full-color atlas" for which funding is being sought.

conclusion

Though a lot has been achieved, even more has to be done. For this the establishment of an International Obstetric Fistula Foundation is of utmost importance.

P.S.
what to do about the rest of the 1,500,000 to 2,000,000 VVF-patients in the whole of Africa?
As prevention at the moment is a utopia, the only thing which will have an impact is to teach as many African doctors as possible how to perform VVF-surgery under primitive conditions.
For this Laure Fistula Center seems to be ideal.

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KANO

annex I

list of trainees

general doctors with at least 3 yr surgical experience

Dr Said AHMED	Jigawa State
Dr Yusha'u ARMIYA'U	Katsina State
Dr Shehu BALA	Katsina State
Dr Umaru DIKKO	Kano State
Dr Benedict ISHAKU	Plateau State
Dr Momoh Omuya KADIR	Kogi State
Dr Hassan LADAN	Kebbi State
Dr Aminu SAFANA	Katsina State
Dr Iliyasu ZUBAIRU	Adamawa State

senior registrars

Dr Yomi AJAYI	IBADAN
Dr Lydia AUDU	SOKOTO
Dr Nestor INIMGBA	PORTHARCOURT
Dr Jesse Yafi OBED	MAIDUGURI
Dr Dapo SOTILOYE	ILORIN
Dr Emmanuel UDOEYOP	JOS

visiting consultants

Prof Dr Shafiq AHMAD	PESHAWAR, Pakistan
Prof Dr Jelte DE HAAN	MAASTRICHT, Holland
Dr Vivian HIRDMAN	STOCKHOLM, Sweden
Dr Oladosu OJENGBEDE	IBADAM, Nigeria
Dr Ulrich WENDEL	MAIDUGURI, Nigeria

annex II

VVF/RVF-repairs in Babbar Ruga and Laure Fistula Centers

	KANO		KATSINA		grand total
	VVF	RVF	VVF	RVF	
1984	-	-	83	6	89
1985	-	-	196	20	216
1986	-	-	260	18	278
1987	-	-	318	7	325
1988	-	-	353	31	384
1989	-	-	464	21	485
1990	222	25	416	29	692
1991*	248	17	195	4	464*
1992	348	27	529	34	938
total	818	69	2,814	170	**3,871**

total VVF-repairs and related operations: 3,632

total RVF-repairs and related operations: 239

total: 3,871

“ sabbatical leave consultant for 6 mth

amenorrhea in vesicovaginal and rectovaginal fistula

Kees WAALDIJK

abstract

OBJECTIVES: To find out the incidence of amenorrhea in vesicovaginal fistula (VVF) and rectovaginal fistula (RVF).
METHODS: In two fistula centers in Northern Nigeria a menstruation history was taken in 891 consecutive VVF patients in 73 consecutive RVF patients. This was correlated with the fistula duration, and nonfistula causes were looked for.
RESULTS: Out of the 213 VVF-patients leaking less than 6 mth, 162 (76.1%) presented with amenorrhea which was considered to be physiologic. Out of the 180 VVF-patients leaking 6 mth to 1 yr, 82 (45.6%) presented with amenorrhea; in 23 (12.8%) a nonfistula cause was found leaving a fistula amenorrhea in 59 (32.8%). Out of the 498 VVF-patients leaking 1 yr or longer, 131 (26.3%) presented with amenorrhea; in 78 (15.7%) a nonfistula cause was found leaving a fistula amenorrhea in 53 (10.6%). The RVF-patients showed the same trend.
CONCLUSION: The great majority of patients with a VVF and/or RVF were menstruating if the fistula duration was 6 mth or longer, i.e. beyond the period where the amenorrhea was considered to be physiologic. This was even more pronounced if the duration was 1 yr or longer.

introduction

There are controversing reports about the incidence of amenorrhea in vesicovaginal fistula (VVF) and/or rectovaginal fistula (RVF) patients.
Naidu and St George stated that amenorrhea was the rule in respectively India and Northern Nigeria {1, 2}.
Hamlin & Nicholson and Waaldijk claimed that amenorrhea was not commonly associated with fistula in respectively Ethiopia and Northern Nigeria {3, 4}.
This study was proceeded to find out the incidence of fistula amenorrhea.

materials and methods

In two fistula centers in Northern Nigeria, respectively Babbar Ruga Fistula Hospital in KATSINA and Laure Fistula Center in KANO, from patient 1,001 onward any new patient was systematically asked whether she was menstruating or not.
This study consisted of 891 new VVF-patients and 73 new RVF-patients operated consecutively by the author. The fistula was obstetric in origin in 831 (93.3%) of the VVF-patients and in 68 (93.2%) of the RVF-patients.
The 175 VVF-patients treated in this period by inserting an indwelling bladder catheter, with or without suturing, were left out of this study as they were only leaking less than 3 months.

results

VVF

Out of the 891 VVF-patients, 375 (42.1%) presented with amenorrhea at the time of operation.
These patients were divided into 3 groups according to the duration of fistula as presented in table 1:

A. Out of the 213 patients leaking less than 6 mth, 162 (76.1%) presented with amenorrhea which was considered to be physiologic.
B. Out of the 180 patients leaking 6 mth to 1 yr, 82 (45.6%) presented with amenorrhea which was considered to be borderline.
C. Out of the 498 patients leaking 1 yr or more, 131 (26.3%) presented with amenorrhea which was considered to be pathologic.

table 1

duration of leakage	number of patients	amenorrhea
<6 mth	213	163 (76.1%)
6 mth to 1 yr	180	82 (45.6%)
≥1 yr	498	131 (26.3%)
total	891	375 (42.1%)

Group B and C were further analysed for other causes than the fistula, and corrected figures are given in table 2.

table 2
fistula amenorrea in VVF

duration of leakage	number	nonfistula amenorrhea	fistula amenorrhea
6 mth to 1 yr	180	23 (12.8%)	59 (32.8%)
≥1 yr	498	78 (15.7%)	53 (10.6%)
total	678	101 (14.9%)	112 (16.5%)

The nonfistula causes as listed in table 3 were: premenarche, postmenopause, lactation, congenital vagina malformation (patient never menstruated), surgical cause {cesarean section hysterectomy for ruptured uterus, (sub)total hysterectomy for other reasons, repair after which menstruation stopped}.

table 3
nonfistula amenorrhea in VVF

cause	duration of leakage 6 mth to 1 yr	> 1 yr
premenarche		7
postmenopause		20
surgery	10	39
lactation	13	7
congenital malformation		5
total	23	78

In 114 (12.8%) of the VVF-patients there had been or still was a combination of VVF and RVF, but this has not been worked out further.

RVF
Out of the 73 RVF-patients, 30 (41.1%) presented with amenorrhea at the time of operation.
Also these patients were divided into 3 groups according to the duration of fistula as presented in table 4:
A. Out of the 12 patients with a duration of less than 6 mth, 10 (83.3%) presented with amenorrhea

B. Out of the 10 patients with a duration between 6 mth and 1 yr, 7 (70.0%) presented with amenorrhea
C. Out of the 51 patients with a duration of 1 yr or more, 13 (25.5%) presented with amenorrhea

table 4

duration of RVF	number	amenorrhea
< 6 mth	12	10 (83.3%)
6 mth to 1 yr	10	7 (70.0%)
≥ 1 yr	51	13 (25.5%)
total	73	30 (41.1%)

Patients from group B and C were analysed further for other causes of amenorrhea than the fistula.
In only 2 patients of group C another cause could be found, viz. premenarche in 1 and hysterectomy in 1, and corrected figures are given in table 5.

table 5
fistula amenorrea in RVF

duration of RVF	number	nonfistula amenorrhea	fistula amenorrhea
6 mth to 1 yr	10		7 (70.0%)
≥ 1 yr	51	2 (3.9%)	11 (21.6%)
total	61	2 (3.3%)	18 (29.5%)

In all the RVF-patients there had been or still was a combination of VVF and RVF, but this has not been worked out further.

discussion

The results in the VVF-patients clearly showed that the longer the fistula existed the less the incidence of amenorrhea was, even more so when nonfistula causes were deducted.
With a fistula duration of one year or longer, only 53 (10.6%) of the 498 patients presented with a fistula amenorrhea.
The cause of fistula amenorrhea may be hypothalamus trauma (hemorrhage at labor, malnutrition, psychic stress) or loss of functioning endometrium or of uterus/cervix (due to the trauma of obstructed labor).
The results in the RVF/(VVF)-patients showed the same trend, but the number was too small to draw further conclusions.
Even if the 184 VVF/RVF-patients in the 2 groups were combined it would have been too complicated to find out if the incidence of fistula amenorrhea was higher in RVF/VVF-patients. Many patients in the VVF-group had been operated already for a RVF and in the RVF-group for a VVF.
Several patients stated that blood loss at menstruation was less than before they developed the fistula, but only amenorrhea was taken into account.

conclusion

The great majority of patients with a VVF and/or RVF in Northern Nigeria were menstruating if the fistula duration was 6 mth or more; even more so if the fistula duration was 1 yr or longer.
Also, if amenorrhea was encountered, nonfistula causes were responsible in a large proportion of these patients.

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foreword

scanning through the world literature no large series could be found with 'complete' baseline data about the vesicovaginal fistula, and especially the obstetric fistula

it seemed that statements made long time ago were taken over indiscriminately by authors following

the intention of this booklet is to provide baseline data of a large series of patients treated consecutively by the author in Northern Nigeria, viz. KATSINA and KANO

also to show that in cohort analysis of 100 consecutive VVF-patients each there is an enormous variety from one cohort to the other

all the data have been obtained by the author himself, with the help of his staff

all the patients were interviewed by the author in hausa, the lingua franca of the region

the Hausa/Fulani population of Northern Nigeria have a good sense of time and count; when there was a real discrepancy between what the patient said and what the team thought other ways were devised to come to the truth.

the first 700 VVF-repair patients, the first 100 VVF-catheter patients and the first 50 RVF-repair patients in KATSINA only have been partly reviewed retrospectively; having obtained enough experience the following patients in KATSINA and KANO have been reviewed prospectively; so there might be some discrepancy between the two groups based on methodology.

however, despite the setting and the setbacks, the obtained information is as accurate as possible

the data have been analysed separately for KATSINA and KANO and for the following groups: VVF-repair, catheter treatment (with/without suturing) and RVF-repair; between 40 and 60% of the patients treated first by catheter later on had a VVF-repair and most of the RVF-patients had a VVF as well

the service in KATSINA was started in 1983 and in KANO recently in 1990; in KANO all the data are prospective

age at which fistula developed

the age at which the fistula developed was calculated from the age of the patient minus the duration of leakage, also in year categories

for the first 700 VVF-patients, the first 100 VVF-catheter patients and the first 50 RVF-patients in KATSINA the age was determined by questioning the patient how old she was and how long she had been married and by our own estimation, taking it for granted that the majority married at 12-13 years
in order to improve the accuracy of our data, later on she was also asked when and where she had her menarche: before marriage in her parents home, after marriage in her husband's home and how long before or after marriage in months resp. years, stating menarche at 12 years of age; any woman, educated or not, must know where and when she had her first menstruation
in doing this it was found out that more than 95% of the girls in the rural areas married premenarchally, the great majority at 11-12 years
when there were real discrepancies, more things were asked such as how long she had been married before she delivered and so on; sometimes it took a long painstaking time

so for the first 850 patients in KATSINA the age was estimated at roughly one year older than for later patients in KATSINA and KANO

however, it might well be possible, that menarche is not at 12 but at 13 years

therefore three calculations were made, sothat anyone can make his/her own conclusions:

- **a** the age as written down in our records taking into account the difference of roughly one year
- **b** the age for a mean menarche at 12 years with correction of the first 850 patients
- **c** the age for a mean menarche at 13 years with correction of the age of later patients

the great majority was teenager when it happened, viz. roughly 70%; even roughly 40% were younger than 16 years old

this means these are girls with their whole adult life still in front of them

however, the age at labor does not play a major role in the development of the fistula, though the author is not in favor of adolescent/child marriage; first, once a woman enters reproductive life she is fit to deliver as well biologically speaking; second, is the pelvis really becoming wider after 1 yr following the first normal menstruation (not functional bleeding)??; third, if there really were a connection, far more women in Northern Nigeria would have a fistula, as more than 90% do marry premenarchally and become pregnant as teenager
in my opinion, if the girls would marry 5 years later and then become pregnant they would develop their fistula 5 yr later

the real cause is the nonavailability of an obstetric service where a cesarean section can be performed within 3 hours from the time labor has become obstructed. With a cesarean section in time, no fistula

age at which fistula developed in year categories

patients	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
katsina-vvf								
1-100		38	31	19	12			
101-200		31	48	14	7			
201-300		37	42	17	4			
301-400		36	35	23	6			
401-500	1	21	45	25	7		1	
501-600	1	27	33	30	9			
601-700		39	25	24	12			
701-800		43	25	20	11	1		
801-900	1	41	28	24	6			
901-1000	2	43	20	28	6	1		
1001-1100	2	45	25	17	10	1		
1101-1200	3	34	25	28	8	2		
1201-1300	1	43	27	19	8	2		
1301-1400		50	13	29	8			
1401-1500		48	21	20	11			
1501-1600	1	42	17	23	16	1		
1601-1700	1	57	12	16	16	3		
kano-vvf								
1-100	4	43	19	25	7	2		
101-200		43	23	20	14			
201-300	4	48	12	20	15		1	
301-400		55	14	21	10			
katsina-catheter								
1-100	2	36	30	26	6			
101-200		49	22	21	8			
kano-catheter								
1-100		59	14	22	5			
katsina-rvf								
1-100	3	46	27	20	3	1		

age at which fistula developed in year categories
total figures per center

total	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
katsina-vvf								
1702	13	676	472	376	153	11	1	
in %	**0.8%**	**39.7%**	**27.7%**	**22.1%**	**9.0%**	**0.6%**	**0.1%**	**%**
kano-vvf								
424	8	207	71	88	47	2	1	
in %	**1.9%**	**48.8%**	**16.7%**	**20.8%**	**11.1%**	**0.5%**	**0.2%**	**%**
katsina-catheter								
292	2	131	61	72	25	1		
in %	**0.7%**	**44.9%**	**20.9%**	**25.7%**	**7.5%**	**0.3%**		**%**
kano-catheter								
133		73	20	30	10			
in %		**54.9%**	**15.0%**	**22.6%**	**7.5%**			**%**
katsina-rvf								
137	3	67	35	26	5	1		
in %	**2.2%**	**48.9%**	**25.5%**	**19.0%**	**3.6%**	**0.7%**		**%**
kano-rvf								
45	1	31	6	5	2			
in %	**2.2%**	**68.9%**	**13.3%**	**11.1%**	**4.4%**			%

age at which fistula developed in year categories
total figures per VVF-repair, VVF-catheter and RVF-repair

total	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
vvf-repair								
2126	21	883	543	464	200	13	2	
in %	**1.0%**	**41.5%**	**25.5%**	**21.8%**	**9.4%**	**0.6%**	**0.1%**	**%**
vvf-catheter								
425	2	204	81	105	32	1		
in %	**0.5%**	**48.0%**	**19.1%**	**24.7%**	**7.5%**	**0.2%**		**%**
rvf-repair								
182	4	98	41	31	7	1		
in %	**2.2%**	**53.8%**	**22.5%**	**17.0%**	**3.8%**	**0.5%**		**%**

age at which fistula developed in year categories corrected for menarche at 12 yr

patients	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
katsina-vvf								
1-100		43	27	18	12			
101-200		47	33	14	6			
201-300		46	36	15	3			
301-400		43	33	19	5			
401-500	1	38	29	24	7		1	
501-600	1	36	25	29	9			
601-700		54	12	24	10			
701-800		43	25	20	11	1		
801-900	1	41	28	24	6			
901-1000	2	43	20	28	6	1		
1001-1100	2	45	25	17	10	1		
1101-1200	3	34	25	28	8	2		
1201-1300	1	43	27	19	8	2		
1301-1400		50	13	29	8			
1401-1500		48	21	20	11			
1501-1600	1	42	17	23	16	1		
1601-1700	1	57	12	16	16	3		
kano-vvf								
1-100	4	43	19	25	7	2		
101-200		43	23	20	14			
201-300	4	48	12	20	15		1	
301-400		55	14	21	10			
katsina-catheter								
1-100	2	43	24	26	5			
101-200		49	22	21	8			
kano-catheter								
1-100		59	14	22	5			
katsina-rvf								
1-100	3	52	23	18	3	1		

age at which fistula developed in year categories corrected for menarche at 12 yr total figures per center

total	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
katsina-vvf								
1702	13	754	408	367	148	11	1	
in %	**0.8%**	**44.3%**	**24.0%**	**21.6%**	**8.7%**	**0.6%**	**0.1%**	**%**
kano-vvf								
424	8	207	71	88	47	2	1	
in %	**1.9%**	**48.8%**	**16.7%**	**20.8%**	**11.1%**	**0.5%**	**0.2%**	**%**
katsina-catheter								
292	2	138	55	72	24	1		
in %	**0.7%**	**47.3%**	**18.8%**	**24.7%**	**8.2%**	**0.3%**		**%**
kano-catheter								
133		73	20	30	10			
in %		**54.9%**	**15.0%**	**22.6%**	**7.5%**			**%**
katsina-rvf								
137	3	73	31	24	5	1		
in %	**2.2%**	**53.3%**	**22.6%**	**17.5%**	**3.6%**	**0.7%**		**%**
kano-rvf								
45	1	31	6	5	2			
in %	**2.2%**	**68.9%**	**13.3%**	**11.1%**	**4.4%**			%

age at which fistula developed in year categories corrected for menarche at 12 yr total figures per VVF-repair, VVF-catheter and RVF-repair

total	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
vvf-repair								
2126	21	961	479	455	195	13	2	
in %	**1.0%**	**45.2%**	**22.5%**	**21.4%**	**9.2%**	**0.6%**	**0.1%**	**%**
vvf-catheter								
425	2	204	81	105	32	1		
in %	**0.5%**	**48.0%**	**19.1%**	**24.7%**	**7.5%**	**0.2%**		**%**
rvf-repair								
182	4	104	37	29	7	1		
in %	**2.2%**	**57.1%**	**20.3%**	**15.9%**	**3.8%**	**0.5%**		**%**

age at which fistula developed in year categories corrected for menarche at 13 yr

patients	1-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
katsina-vvf								
1-100		38	31	19	12			
101-200		31	48	14	7			
201-300		37	42	17	4			
301-400		36	35	23	6			
401-500	1	21	45	25	7		1	
501-600	1	27	33	30	9			
601-700		39	25	24	12			
701-800		31	35	21	12	1		
801-900	1	32	33	27	7			
901-1000	2	34	26	30	7	1		
1001-1100	2	37	28	20	9	4		
1101-1200	3	23	35	26	11	2		
1201-1300	1	32	35	21	8	3		
1301-1400		41	21	25	13			
1401-1500		40	23	25	11	1		
1501-1600	1	33	26	18	20	2		
1601-1700	1	45	22	14	14	4		
kano-vvf								
1-100	4	35	26	24	9	2		
101-200		35	28	21	16			
201-300	4	42	18	16	18	1	1	
301-400		41	25	22	12			
katsina-catheter								
1-100	2	27	37	27	7			
101-200		43	27	15	15			
kano-catheter								
1-100		46	24	20	9	1		
katsina-rvf								
1-100	3	40	33	19	4	1		

age at which fistula developed in year categories corrected for menarche at 13 yr total figures per center

total	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
katsina-vvf								
1702	13	578	543	379	170	18	1	
in %	**0.8%**	**34.0%**	**31.9%**	**22.3%**	**10.0%**	**1.1%**	**0.1%**	**%**
kano-vvf								
424	8	168	103	85	56	3	1	
in %	**1.9%**	**39.6%**	**24.3%**	**20.0%**	**13.2%**	**0.7%**	**0.2%**	**%**
katsina-catheter								
292	2	108	78	66	36	2		
in %	**0.7%**	**37.0%**	**26.7%**	**22.6%**	**12.3%**	**0.7%**		**%**
kano-catheter								
133		58	32	27	14	2		
in %		**43.6%**	**24.1%**	**20.3%**	**10.5%**	**1.5%**		%
katsina-rvf								
137	3	55	47	25	6	1		
in %	**2.2%**	**40.1%**	**34.3%**	**18.2%**	**4.4%**	**0.7%**		**%**
kano-rvf								
45	1	26	10	6	2			
in %	**2.2%**	**57.8%**	**22.2%**	**13.3%**	**4.4%**			%

age at which fistula developed in year categories corrected for menarche at 13 yr total figures per VVF-repair, VVF-catheter and RVF-repair

total	0-10	11-15	16-20	21-30	31-40	41-50	51-60	yr
vvf-repair								
2126	21	746	646	464	226	21	2	
in %	**1.0%**	**35.1%**	**30.4%**	**21.8%**	**10.6%**	**1.0%**	**0.1%**	**%**
vvf-catheter								
425	2	166	110	93	50	4		
in %	**0.5%**	**39.1%**	**25.9%**	**21.9%**	**11.8%**	**0.9%**		**%**
rvf-repair								
182	4	81	57	31	8	1		
in %	**2.2%**	**44.5%**	**31.3%**	**17.0%**	**4.4%**	**0.5%**		**%**

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