national vvf project nigeria

evaluation report I

(January through June 1992)

reprint

Babbar Ruga Fistula Hospital
KATSINA

and

Laure Fistula Center
KANO

by

Kees WAALDIJK

reprint

sponsored and financed by:
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VVF-projects

Babbar Ruga Fistula Hospital
KATSINA

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Laure Fistula Center
KANO

by

Kees WAALDIJK

first evaluation report

VVF-projects KANO and KATSINA

introduction

The VVF-service in Babbar Ruga Fistula Hospital was started in 1984, and in Laure Fistula Center it was started in 1990.
As it is important to monitor the activities in the two centers in KATSINA and KANO, this is the first of a series of evaluation reports in order to compare the progress made sofar against the project documents.

short-term objectives

KATSINA
An internal shift within the hospital facilities has been made whereby at any time the number of postoperative beds can be step-wise increased up to a total of 75.
The operating theater has been upgraded. As a result of this and due to a very strict intra- and postoperative management the infection rate is less than 0.5%.
The hostel with 150 beds is sufficient to cope with the number of patients coming to the hospital.
KANO
Arrangements with the authorities of Murtala Muhammed Specialist Hospital are being made to extend the postoperative facilities with another 10-20 beds making a total of 40 postoperative beds.
The hostel can accommodate up to 70 patients at the time. This has to be extended to 100 patients, as there is a sharp increase in the number of fistula patients coming to the hospital.
In both centers there is a need for 2 hydraulic well-functioning operation tables; so four in total.

training

Sofar 3 Nigerian doctors have been or are being trained in KANO and 3 Nigerian doctors in KATSINA; also other doctors have come to familiarize themselves with fistula surgery (see Annex I).
The National Task Force on VVF has received applications from another 5 Nigerian doctors, and their training will start in July 1992.
Arrangements have been made with Dr H OJENGBEDE, head of department Ibadan University Hospital, to accept a total of 6 senior registrars to get some practice; their training will start in August 1992.

training curriculum

A training curriculum has been made with the minimum requirements of the candidates and the objectives of their training. This has been sent to the Federal Ministry of Health and to the National Task Force on VVF.

activities

Due to the awareness programm by the NCWS and National Task Force on VVF with the help of the mass media (television, radio, daily newspapers and magazines) there was a sharp increase in the number of VVF-patients coming forward for treatment; as such also the number of operations had to be increased.
During the first 6 months of 1992 an unbelievable total of 564 new VVF-patients were seen, and a total of 471 surgical procedures were performed (see Annex II).

research

Right from the beginning a database was set up which contains now some 175,000 entries, including 15,000 color slides/photos.

Several scientific articles could be prepared and were submitted for publication or presentation (see Annex III).

The **incidence rate** of obstetric fistula was calculated at **2 per 1,000 deliveries minimally** where the mother survives when there is no easy access to a functioning obstetric unit. This means an **annual incidence** of at least **11,000 new** VVF-patients in the whole of Nigeria and that there are **a minimum of 150,000 VVF-patients in Nigeria awaiting surgery**.

Several surgical technics were developed such as circumferential repair of circumferential fistula (circumferential dissection, advancement and end-to-end vesicourethrostomy), an effective and simple stress incontinence operation and some others.

However, the greatest achievement sofar seems to be the immediate repair of fresh obstetric fistulas with a success rate of 80-85%. During 1992 some 150-200 patients will be treated this way. If the trend of the initial success rate contines, it will be a breakthrough as then the patient can be surgically repaired as soon as the slough has gone. No need to wait for 3 mth, and it can be performed **on an outpatient base**.

conclusion

The activities and the progress made are more or less in line with the objectives of the project documents.

kees waaldijk MD PhD
chief consultant surgeon i/c

Babbar Ruga Fistula Hospital
P.O.Box 5
KATSINA

and

Laure Fistula Center
Murtala Muhammed Specialist Hospital
KANO

30th of June 1992

annex I

list of trainees

KATSINA

Dr Yusha'u ARMIYA'U	Katsina State
Dr Shehu BALA	Katsina State
Dr Aminu SAFANA	Katsina State

KANO

Dr Said AHMED	Jigawa State
Dr Umaru DIKKO	Kano State
Dr Iliyasu ZUBAIRU	Adamawa State

other doctors to familiarize themselves with VVF-surgery

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

annex II

VVF/RVF operations 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 (1st half)	154	9	298	10	471
total	624	51	2,583	146	**3,404**

total VVF-repairs and related operations: **3,207**

total RVF-repairs and related operations: **197**

total: 3,404

*sabbatical leave consultant for 6 mth

THE OBSTETRIC FISTULA: A MAJOR PUBLIC HEALTH PROBLEM STILL UNSOLVED

by

Kees WAALDIJK and Yusha'u D. ARMIYA'U

"Carried by her mother and her grandmother this 14-year-young girl was brought into the examination room smelling offensively. Cachectic from the enormous effort and trauma it had taken her to deliver over a period of 4 days a dead male infant without professional help in the bush, she was too weak to support herself; also she had developed bilateral drop feet. The very offensive smell was due to the continuous leaking of urine per vaginam from an extensive urethrovesicovaginal fistula and to the passing of diarrheic stools per vaginam from an extensive rectovaginal fistula with total perineal rupture and sphincter ani rupture; the cervix and uterus could not be identified, most of the paraurethral, deep transverse perineal and levator ani muscles were gone, and the labia minora were (sub)totally lost; in fact she presented with one big cloaca. She had as well deep pressure ulcers over the sacrum and both major trochanters; the wounds over the scapulae had healed off with scar tissue. She did not remember very much as she had been unconscious or semiconscious most of the time. What a change from the proud girl who had been married 3 years ago to an elderly man who did not want to have his wife around anymore. The only proud thing about her now were her breasts, unbelievably still young and full as if nothing had happened, reminding us that this was a young girl whose adolescent and adult life had been wrecked at a time when it should have had started." own observation

introduction

The vesicovaginal fistula (VVF) is as old as mankind and has been a constant source of misery to the women affected.

The main cause, in over 85%, is obstructed labor which is not relieved in time by a cesarean section sothat pressure necrosis of the bladder and anterior vagina wall develops as these are being compressed between the fetal skull and maternal symphysis.

There is a frequent combination with other intravaginal and extravaginal lesions. The intravaginal lesions are rectovaginal fistula (RVF), loss of pelvic floor muscles and vagina stricture or stenosis. The extravaginal lesions are peroneal paralysis, pressure ulcers over prominent bones such as sacrum and poor health or even cachexia.

The trauma of unrelieved obstructed labor is such that most of the mothers die, and only the "lucky" ones survive for the price of a fistula and a stillborn infant. Then the real trouble starts as the social implications are far reaching. Due to the continuous dribbling of urine along their legs, the wetting of their clothes and the accompanying offensive smell, most communities consider these women as outcasts. If no cure is obtained within a short period of time their husbands divorce them, and they end up as low-cost prostitutes when young and as beggars later on. Sometimes they are not even allowed to live in the village, but have to stay outside, as people think the condition is contagious.

Though exceptionally the fistula may heal spontaneously, with or without the help of an indwelling bladder catheter, the majority of VVF-patients can only be helped, if at all, by surgical intervention.

But even if the fistula itself has been closed, there may remain some other serious problems such as urinary (stress) incontinence, vagina stenosis or even atresia, and infertility.
Only if all these problems have been solved, can the patient be restored to a normal social life.
However, as a definite solution cannot always be found, it is clear that some patients have to live socially and physically crippled until they die.

magnitude and analysis of the problem

Though almost disappeared in the industrialized world the VVF is still very prevalent in the developing world where it constitutes a major public health problem. Unfortunately, only very few people are aware of this. It seems that some 140 years after James Marion SIMMS the obstetric fistula, from which modern gynecology started, has been forgotten despite a high world-wide prevalence.
From the authors' experience in Northern Nigeria where even a total of 700 repairs a year are not sufficient to cope with all the VVF-patients presenting themselves, the incidence rate can be calculated at 1-2 per 1,000 deliveries where the mother survives in situations where there is no easy access to a functioning obstetric unit.
The annual incidence is being estimated at a minimum of 50,000 to 100,000 new VVF-patients in the world. As only a minority is being operated upon, the prevalence is at least 500,000 VVF-patients in need of an operation; their actual number may be well over 2 million.
To understand the problem in the developing countries, there is obstruction at every level of obstructed labor management, viz. obstruction of diagnosis, obstruction of decision taking what to do with the patient, obstruction in fund raising for transport and medical care, obstruction of transport to get the patient to a hospital, and obstruction at secondary and tertiary health care to organize for a cesarean section.

future

Though the VVF is preventable, it will be a major public health problem for many years to come, as funds are missing to set up an adequate network of good obstetric/gynecologic care throughout the world, as it will take a long time to change sociocultural patterns and as the industrialized world is not aware of it and as such not really interested in it.
Actually the prevalence will increase as the population in the developing world is exploding so rapidly without concurrent increase in health facilities.
As the VVF is the only major public health problem where the prevention and the treatment is highly specialized, i.e. surgery, it cannot be solved within the primary health care system, and one has to rely upon the secondary and tertiary health care. The only role the primary health care can play is to detect risk factors in pregnant women and to diagnose obstructed labor and then take action to get a cesarean section performed as soon as possible.
As it is a typical problem of the developing world, it can only be tackled within the limited resources of that world, with some help of the industrialized world as developing aid.

recommendations

From a public health viewpoint, the following recommendations are made to have an impact upon an almost hopeless situation:

a. prevention

health education to the general public in developing countries by all means of information (radio, television, newspaper, poster, school, antenatal clinic etc.) that any woman who is in labor longer than 1 day should be brought as soon as possible to the nearest hospital where a cesarean section can be performed; time and general education have to take care of establishing a network of transport and functioning obstetric units

b. research

to stimulate more simple/complex field research in order to compile accurate baseline data including incidence, prevalence and other regional factors

c. rehabilitation

multiple small low-cost VVF-units have to be set up within the existing health system of the developing countries where with a minimum of equipment and materials the simple repairs can be performed; for the complicated fistulas the existing teaching hospitals can be used

following a successful repair there is total and spontaneous resocialization of the woman into her own society

d. training

indigenous doctors of the developing countries should be trained sothat they know which types of fistula they can handle themselves and which types they better refer to the teaching hospitals

e. financing

as the developing countries have limited resources, it has to be a joint venture between the respective governments, the voluntary aid organizations and the governments of the industrialized countries in the form of bi- or multilateral agreements

f. worl-wide attention

this is a task for the World Health Organization within their program for Safe Motherhood; also the United Nations Fund for Population Activities should participate in this

g. voluntary aid

the founding of a VVF Relief Association to deal exclusively with these problems is long overdue

h. backlog of patients

this will be a problem as expertise how to handle VVF under primitive conditions within a low budget (US dollars 20-25 per operation for all anesthesia/surgery materials) is very scarce; still a team should be formed which could be used for setting up a VVF-unit and then move to another unit, and also for training

conclusion

There is a group of minimally 500,000 VVF-women in this world seriously suffering physically, psychically and socially for whom not very much is being done, and it is high time to start giving them the attention and care they deserve.

kees waaldijk MD PhD
Babbar Ruga Fistula Hospital
P.O.Box 5
KATSINA
Nigeria

Laure Fistula Center
Murtala Muhammed Hospital
KANO
Nigeria

yusha'u d armiya'u
Commissioner for Health
Katsina State
KATSINA
Nigeria

19th of october 1990

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the obstetric fistula and peroneal nerve involvement; an analysis of 947 patients

Kees WAALDIJK and Thomas E ELKINS

introduction

There is a frequent combination of the obstetric vesicovaginal fistula (VVF) with other intra- and extravaginal lesions.
The intravaginal lesions are rectovaginal fistula (RVF), loss of pelvic floor muscles and vagina stricture or stenosis. The extravaginal lesions are peroneal paralysis, pressure ulcers over prominent bones such as sacrum and poor health or even cachexia.
There are only few reports dealing with (motor) lesions of the peroneal nerve following the trauma of obstructed labor not relieved in time.

materials and methods

A. In a first group of 470 obstetric fistula patients consecutively operated in Northern Nigeria, only (sub)total loss of motor function of the peroneal nerve was noted down as part of the patient documentation. However, as minor loss of motor function was not looked for and the patient not asked about weakness of legs or drop foot, the real incidence of peroneal nerve trauma could not be determined.
B. Therefore in a second group of 479 obstetric fistula patients treated consecutively during 1990, it was tried to find the true incidence of peroneal nerve trauma. These patients were systematically asked about drop foot and those with weakness of the leg(s) for over 1 month were considered to have (had) peroneal paralysis; if they still complained about weakness at time of examination a voluntary muscle testing (VMT) was perfomed with grading 0-5 (whereby 0=no function at all and 5=normal).

results

A. first group of 470 patients
A uni- or bilateral peroneal paralysis with drop foot was noted in 25 (5.3%) of the 470 patients: in 22 (12.6%) out of the 174 patients with a fistula duration of less than 2 years and in only 3 (1.0%) out of the 296 patients with a fistula duration of 2 years or longer (table I).

table I
signs of gross peroneus paralysis in first 470 patients

leaking	number	signs of
< 2 yr	174	22 (12.6%)
≥ 2 yr	296	3 (1.0%)
total	470	25 (5.3%)

B. second group of 479 patients
Signs of peroneal nerve trauma were found in 127 (26.5%) of the 479 patients: in 99 (36.9%) of the 268 patients leaking less than 2 years and in 28 (13.3%) of the 211 patients leaking 2 years or more (table II).
A history of drop foot was found in 184 (38.4%) of the 479 patients: in 56 (20.9%) of the 268 leaking less than 2 years and in 128 (60.7%) of the 211 leaking 2 years or more (table II).
When history and signs were combined, the peroneal nerve was damaged in 311 (64.9%) of the 479 patients: in 155 (57.8%) of the 268 patients leaking less than 2 years and in 156 (73.9%) of the 211 patients leaking 2 years or more (table II).

table II

history/signs of peroneal paralysis in 479 patients

		leaking	number	history of	signs of	total
< 2 yr	268	56 (20.9%)		99 (36.9%)	155 (57.8%)	
≥ 2 yr	211	128 (60.7%)		28 (13.3%)	156 (73.9%)	
total	479	184 (38.4%)		127 (26.5%)	311 (64.9%)	

combination VVF/RVF

Peroneal nerve trauma was found in 63 (75.9%) of the 83 patients with a combination of VVF and RVF (table III) and in 248 (62.6%) of the 396 patients with VVF only (table IV).

table III

history/signs of peroneal paralysis in the 83 VVF/RVF-patients

		leaking	number	history of	signs of	total
< 2 yr	39	6 (15.4%)		20 (51.3%)	26 (66.7%)	
≥ 2 yr	44	27 (61.4%)		10 (22.7%)	37 (84.1%)	
total	83	33 (39.8%)		30 (36.1%)	63 (75.9%)	

table IV

history/signs of peroneal paralysis in the 396 VVF patients

		leaking	number	history of	signs of	total
< 2 yr	229	50 (21.8%)		79 (34.5%)	129 (56.3%)	
≥ 2 yr	167	101 (60.5%)		18 (10.8%)	119 (71.3%)	
total	396	151 (38.1%)		97 (24.5%)	248 (62.6%)	

distribution right/left

Out of the 127 patients with signs of peroneal paralysis, 15 had it bilaterally; out of the 142 affected peroneal nerves it was in 79 (55.6%) on the right side and in 63 (44.4%) on the left side.

Out of the 184 patients with history of peroneal paralysis, 32 had it bilaterally; out of the 216 affected peroneal nerves it was in 133 (61.6%) on the right side and in 83 (38.4%) on the left side.

Out of the 311 patients with history and/or sign of peroneal nerve damage combined, 47 had it bilaterally; out of the 358 affected peroneal nerves it was in 212 (59.2%) on the right side and in 146 (40.8%) on the left side.

grading of the peroneal nerve damage

Further analysis of the 142 peroneal nerve damages still found in 127 patients according to grading on the VMT scale is given in table V.

table V

analysis of 142 peroneal nerve damages found in 127 patients

grade	0	1		2	3	4
leaking < 2 yr	13	10	29	34	25	
leaking ≥ 2 yr	6	2	8	7	8	
total	19	12	37	41	33	

loss of sensory function

In both groups with a total of 947 patients no plantar foot ulcers were seen as an indication of sensory loss; however, specific investigation by sensitivity testing has not been carried out

discussion

As the pressure and thus the eventual damage can be anywhere within the birth canal during obstructed labor, patients with an obstetric fistula may have more lesions than VVF only.

This study from Northern Nigeria shows the very high rate of peroneal nerve trauma in combination with the obstetric fistula, as 311 (64.9%) out of 479 patients had signs and/or history of motor lesions of the peroneal nerve.
The mechanism is compression of the intrapelvic part of the ischiadic nerve (sacral plexus) between the fetal skull and the maternal bony pelvis.
The difference between the two groups is clear: in the first group only gross peroneal damage was noted and in the second group the patients were systematically asked and examined for peroneus nerve trauma.
The right side (59.2%) seems to be slightly more involved than the left side (40.8%), when taking the history as well as when signs were still present; and 47 patients had bilateral nerve trauma.
As expected the incidence was higher in the VVF/RVF patients than in the VVF-only patients, as the trauma is more severe to develop the combination VVF/RVF.
There is a good chance of spontaneous recovery, as out of the 211 patients leaking $\geq$ 2 years only 28 (13.3%) had signs of peroneal nerve trauma. However, permanent severe loss of motor function (grade 0, 1 and 2) was still found in 16 (7.6%) of them.
No plantar foot ulcers as an indication of sensory loss were seen, but no specific sensitivity testing has been performed.

summary
It was tried to find the incidence of peroneal nerve trauma in patients with an obstetric fistula in Northern Nigeria.
Gross peroneal paralysis with drop foot was seen in 25 (5.3%) out of a first group of 470 consecutive patients with an obstetric fistula: in 22 (12.6%) of the 174 leaking less than 2 years and in 3 (1.0%) of the 296 leaking 2 years or more. As minor loss of motor function was not looked for and no special history taken, the real incidence of peroneal nerve trauma could not be determined. It must have been higher.
Therefore an appropriate history was taken and if indicated a voluntary muscle testing performed in another group of 479 consecutive patients with an obstetric fistula. History and/or signs of peroneal nerve trauma were noted in 311 patients (64.9%). Signs of peroneal nerve trauma were found in 99 (36.9%) of the 268 patients leaking less than 2 years and in 28 (13.3%) of the 211 patients leaking 2 years or more. This shows that there is a good chance of spontaneous recovery within 2 years. However, permanent severe loss of motor function was still found in 16 patients (7.6%).
As expected the involvement of the peroneal nerve was higher if the vesicovaginal fistula was combined with a rectovaginal fistula.
The right side (59.2%) was slightly more affected than the left side (40.8%); 47 patients had bilateral nerve trauma.
No plantar foot ulcers as an indication of sensory loss were seen, but no specific sensitivity testing had been performed.
The mechanism of action seems to be compression of the intrapelvic part of the ischiadic nerve (sacral plexus) between the fetal skull and the maternal bony pelvis.

kees waaldijk MD PhD
chief consultant surgeon

Babbar Ruga Fistula Hospital
P.O.Box 5
KATSINA
and
Laure Fistula Center
Murtala Muhammed Specialist Hospital
KANO

15th of June 1991

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VVF_INCI.02

preliminary incidence of obstetric fistula in Northern Nigeria

Kees WAALDIJK

introduction

The numbers of VVF-patients in the world are being underestimated because it is not easy to come to true incidence and prevalence figures. This report is a try and only based upon VVF-patients coming to the hospital for treatment with all the shortcomings of this procedure.

materials

In the first 3 months of 1992, a total of 406 new VVF-patients were seen in Babbar Ruga Fistula Hospital, KATSINA and in Laure Fistula Center, KANO; and already over 300 surgical procedures have been performed.

Katsina State

After 7 years of functioning it is reasonable to claim that there is a fully established VVF-service for Katsina State in Babbar Ruga Fistula Hospital.
Out of these 406 patients, 85 new patients were seen who were KATSINA indigenes and leaking less than 1 year; if continuing like this (and why not?) some 340 patients will be seen in 1992 coming from Katsina State and leaking less than 1 year.
However, still quite a number of VVF-patients (how many ??) will not come forward as they are not aware that something can be done or as they simply do not have the possibility/means of traveling to Babbar Ruga Fistula Hospital. For instance this year a patient came for treatment living in KATSINA Town only 5 km from this hospital, leaking 25 years, never operated and N.B. related to a higher officer of the Hospital Services Management Board of Katsina State; she has been operated now successfully.
According to the latest census there are 3.9 million people in Katsina State.
With an average life expectancy of 50 years, an annual population growth rate of 3.3%, a maternal mortality rate of 1.5% and a perinatal mortality rate of 10%, there will be some 230,000 deliveries this year where the mother survives.
This means that the annual incidence rate of obstetric fistula for 1992 will be at least 1.5 per thousand deliveries where the mother survives, only calculating the patients coming forward for treatment.

Kano State

After 2 years of functioning it is reasonable to state that the VVF-service for Kano State in Laure Fistula Center is not yet fully established.
Out of these 406 patients, 72 new patients were seen who were Kano indigenes and leaking less than 1 year; if continuing like this (and why not?) some 290 new patients will be seen in 1992 coming from Kano State and leaking less than 1 year.
However, still quite a number (how many??) will not come forward, as they are not aware (the service is fairly new) that something can be done or simply as they have no possibility/means to travel to Laure Fistula Center.
According to the latest census there are 5.6 million people living in Kano State.
With an average life expectancy of 50 years, an annual population growth rate of 3.3%, a maternal mortality rate of 1.5% and a perinatal mortality rate of 10%, there will be some 330,000 deliveries this year where the mother survives.
This means that the annual incidence rate of obstetric fistula for 1992 will be at least 0.9 per thousand deliveries where the mother survives, only calculating the patients coming forward for treatment.

What is most disturbing in Kano is that out of these 72 patients 28! were coming from within KANO metropolis, i.e. from a walking distance to many private and government hospitals.
This also shows that the awareness that something can be done is present inside KANO City, but not very great outside KANO City.
If calculated for KANO metropolis the incidence rate is also at least 1.5 per thousand deliveries where the mother survives i.e. only for the patients coming forward for treatment.

conclusions
From the above it is clear that the incidence rate of obstetric fistula in Northern Nigeria is at least 2 per thousand deliveries where the mother survives.
However, only the minimum can be indicated and the true incidence still has to be found.

2nd of April 1992

kees waaldijk MD PhD
chief consultant surgeon i/c

Babbar Ruga Fistula Hospital
P.O.Box 5
KATSINA

and

Laure Fistula Center
Murtala Muhammed Hospital
KANO

VVF_PREV.01

prevalence of obstetric fistula in (Northern) Nigeria

Kees WAALDIJK

introduction

It is important to have some epidemiologic data of VVF sothat we know what to do in terms of planning. There are no reports dealing with the prevalence of VVF.

materials

Based upon studies in Katsina and Kano State it has been found that the minimum incidence rate of VVF is 2 per thousand deliveries where the mother survives.
As the conditions in the whole of (Northern) Nigeria and in the rest of developing Africa are not very much different from the situation in KANO and KATSINA, it is safe to assume that the incidence is more or less the same.

incidence

In Northern Nigeria with a population of 50 million (census 1991), an annual population growth rate of 3.3%, a life expectancy of 50 years, a maternal mortality rate of 1.5% and a perinatal mortality rate of 10% there will be 3 million deliveries this year where the mother survives. This means that for 1992 there will be at least 6,000 new VVF-patients.
For the whole of Nigeria with a population of 90 million there will be 5.5 million deliveries where the mother survives. This means that for 1992 there will be at least 11,000 new VVF-patients.

prevalence

In 1992 there will be a maximum of 1,500 **successful** VVF-repairs in the whole of Nigeria, so already a backlog of minimally 9,500 VVF-patients in need of surgery for 1992.
As 70% of the women develop their fistula below the age of 20 years and with an average life expectancy of 50 years, a VVF-patient will live a mean of 30 years with her fistula if nothing is being done. As she is perhaps more at risk for (urinary tract) infections let us say 20 years.
Taking into account the population of the past (less than at the moment), there are a **minimum of 150,000 VVF-patients in Nigeria in need of surgery** of whom 80,000 to 90,000 are in Northern Nigeria.

future

As there is a population explosion without concurrent increase in health facilities, the number of obstructed labors and the number of new VVF-patients will **increase** every year and as such the prevalence will increase as well.

There is not only obstruction of labor, but obstruction at any level of obstructed labor management such as: obstruction at antenatal care, obstruction at diagnosis, obstruction at decision taking what to do with the woman, obstruction at raising money for transport and medical care, obstruction at transport, and obstruction at primary, secondary and tertiary health care.
The problem is that the prevention of obstetric fistula is highly specialized, i.e. a cesarean section which has to be performed within 3 hours from the time labor has become obstructed.
Only if all the factors involved have been solved, will there be a reduction in the incidence of VVF.

conclusion

The obstetric fistula is still a major public health problem in (Northern) Nigeria and it will take a long time of careful short- and long-term planning to have an impact upon the situation.

2nd of April 1992

kees waaldijk MD PhD
chief consultant surgeon i/c

Babbar Ruga Fistula Hospital
P.O.Box 5
KATSINA

and

Laure Fistula Center
Murtala Muhammed Specialist Hospital
KANO

scientific papers

accepted

The (surgical) management of bladder fistula in 775 women in Northern Nigeria, 1989, thesis, University of Utrecht

A classification of vesicovaginal fistula according to its anatomic location with regards to operation technic and prognosis; a personal experience in 1,250 patients, 1990, paper presented at the IXth Congress of European Association of Urologists in Amsterdam

prepared and sent off

The obstetric fistula: a major public health problem still unsolved
accepted for publication by Int Urogyn J

A classification of vesicovaginal fistula

The obstetric fistula and peroneal nerve involvement; an analysis of 947 patients

Amenorrhea in vesicovaginal and rectovaginal fistula

Step-by-step surgery of vesicovaginal fistula; a full-color atlas

presented at National Task Force on VVF

Preliminary incidence of obstetric fistula in Northern Nigeria

Prevalence of obstetric fistula in (Northern) Nigeria

in preparation

The immediate surgical management of fresh obstetric fistulas

Spinal anesthesia in VVF/RVF surgery

Baseline epidemiologic and clinical data in 2,500 consecutively operated VVF/RVF-patients

The circumferential repair of the circumferential fistula; a theoretic and practical solution of the problem

The role of the indwelling bladder catheter in VVF management

A simple and effective operation technic for postoperative urinary stress incontinence following VVF-repair

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