Designing & Evaluating Clinical Algorithms for STI Case Management

Francis J. Ndowa
WHO
RHR/STI
Session outline

- STI case management
- STI syndromic case management
- Algorithms development
- Implementation
- Algorithms evaluation
- Exercise (Group + presentation)
Objectives of an STI programme

- to interrupt the transmission of sexually transmitted infections
- to prevent development of disease, complications and sequelae
- to reduce the risk of HIV infection
Objectives of STI case management

- to provide appropriate antimicrobial therapy in order to:
  - obtain cure of infection
  - decrease infectiousness
- to limit or prevent high risk behaviour
- to ensure that sexual partners are treated in order to interrupt the chain of transmission
STI case management: Requirements

- Accurate diagnosis
- Treat at first encounter
- Rapid cure with effective drugs
- Simplicity
- Integrated approach
- Condom promotion
- Education/Counselling
- Partner notification
Comprehensive STI case management

- History taking (symptoms)
- Examination (signs)
- Treatment
  - Client and sexual partner(s)
- Counselling for STIs and PITC for HIV
  (provider initiated testing and counselling for HIV)
- Condom promotion
Factors that influence patients’ choice of facility

- **Accessibility**
  - proximity
  - affordability

- **Acceptability**
  - non-stigmatising
  - non-judgmental staff attitudes
  - convenient opening hours
  - affordable fees

- **Quality of services**
  - efficiency of service delivery
  - competence of staff
  - effectiveness of therapy
  - availability of drugs
Diagnostic approaches to STI

Disadvantages

- neither sensitive nor specific
- mixed infections cannot be detected
- simple tests not available/do not exist
- cost: existing rapid test expensive
- delay: results not readily available
- costs of over-treatment
- side-effects of over-treatment

clinical

laboratory

syndromic
STI syndromic case management: definition

- Syndromic diagnosis:
  identification of consistent group of symptoms and easily recognised signs (syndromes)

- Syndromic treatment:
  treat the main organisms responsible for causing the syndrome
How syndromic management works

Through a series of flow-charts:

- guides the health-care worker through the correct identification and treatment of an STI-associated syndrome
- offers a package of comprehensive care from history taking, examination, to counselling/education on risk reduction and partner notification and treatment
Patient complains of urethral discharge or dysuria

Take history and examine Milk urethra if necessary

Discharge confirmed?

No

Any other genital disease?

No

Yes

TREAT FOR GONOCOCCAL INFECTION AND CHLAMYDIA TRACHOMATIS

- Educate and counsel
- Promote condom use and provide condoms
- Manage and treat partner
- Offer HIV counselling and testing if both facilities are available
- Ask patient to return in 7 days if symptoms persist

Yes

Use appropriate flow chart

- Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available
- Review if symptoms persist
Patient complains of urethral discharge (dysuria)

Examine: milk urethra if necessary

Discharge confirmed?

- Yes
  - Microscopy
    - Intracellular diplococci present?
      - Yes
        - Treat for gonorrhoea and Chlamydia
        - Educate, Counsel etc.
        - Return if necessary
      - No
        - Use appropriate flow chart
          - Treat for chlamydia only
          - Educate, counsel etc.
          - Return if necessary
    - No
      - Ulcer(s) present?
        - Yes
          - Educate
          - Counsel if needed
          - Promote/provide condoms
        - No
          - Use appropriate flow chart
Patient complains of genital sore or ulcer

Examine

Ulcer present?

Yes

- Treat for syphilis and chancroid
- Educate and Counsel etc.
- Advise to return in 7 days

No

Vesicular or recurrent lesion(s) present?

Yes

- Management of herpes
  - Educate
  - Counsel if needed
  - Promote/provide condoms

No

- Educate
- Counsel if needed
- Promote/provide condoms
Agents causing genital ulcer disease (GUD) by Region until 1990’s

- **Africa**
  - Undetermined: 10
  - Donovanosis: 25
  - LGV: 40
  - Chancroid: 19
  - Syphilis: 73
  - HSV: 10

- **Asia**
  - Undetermined: 5
  - Donovanosis: 20
  - LGV: 10
  - Chancroid: 45
  - Syphilis: 73
  - HSV: 10

- **Europe, USA**
  - Undetermined: 10
  - Donovanosis: 15
  - LGV: 10
  - Chancroid: 45
  - Syphilis: 73
  - HSV: 10

This chart illustrates the distribution of agents causing genital ulcer disease (GUD) across different regions until the 1990s.
Proportion of genital ulcers in which HSV-2 was isolated in Africa over time

Aetiology of GUS by M-PCR and culture in Masaka, Uganda

- Herpes: 40%
- None: 32%
- Other: 13%
- Multiple: 10%
- Chancroid: 3%
- Syphilis: 2%

Source: Dr. Anatoli Kamali, Uganda
In 1993 a study was done by the National AIDS Control Program in Botswana in collaboration with the STD Research Unit, South African Institute for Medical Research, Johannesburg among 108 GUD patients.

Source: M. Rahman, ISSTDR, Ottawa 2003
Botswana
Aetiology of genital ulcer disease 2002

- HSV2: 59%
- No organism identified: 39%
- T. Pallidum: 2%
- H. ducreyi: 1%

N=137
TPHA/RPR - 15%
HIV - 30%

Source: M. Rahman, ISSTDR, Ottawa 2003
Current genital ulcer algorithm in Botswana

Complaint sores/ulcer on genitals

Vesicles, blisters or history of recurrence

Yes

Soak in warm water, educate, condoms

No

Ulcer found on genitals

No

Other STD?

Yes

Treat

No

Educate

Yes

Treat for syphilis and chancroid
Review in 7 days

Other STD?

Yes

Treat

No

Ulcer healed

Sensitivity 33%
Specificity 45%
Over treatment rate 99%
Infections missed 67%
Cost per infection Tx. $88.0

Source: M. Rahman, ISSTDR, Ottawa 2003
Piloted genital ulcer algorithm in Botswana

Complaint of sores/ulcer on genitals

- Only vesicles present?
  - Yes: Treat for herpes, return in 7 days if symptoms persist
  - No: Ulcer found on genitals
    - Yes: Other STI?
    - No: Other STI?

- Yes: Treat for syphilis, chancroid and herpes, Ask patient to return in 7 days

- Ulcer healed
  - Yes: Other STI?
  - No: Ulcer improved but not healed, continue therapy for 7 days and return

- Ulcer not improved
  - REFER

Sensitivity: 99%
Specificity: 13%
Over treatment rate: 36%
Infections missed: 1%
Cost per infection Tx.: $4.5

Source: M. Rahman, ISSTDR, Ottawa 2003
Patient complains of a genital sore or ulcer

Take history and examine

Only vesicles present?

Yes

TREAT FOR HSV2. TREAT FOR SYPHILIS IF INDICATED¹

⁠• Educate and counsel
⁠• Promote condom use and provide condoms
⁠• Offer HIV counselling and testing if both facilities are available
⁠• Ask patient to return in 7 days

Ulcer(s) healed?

No

Sore or ulcer present?

No

TREAT FOR SYPHILIS AND ChanCROID. TREAT FOR HSV²

⁠• Educate and counsel
⁠• Promote condom use and provide condoms
⁠• Offer HIV counselling and testing if both facilities are available

Ulcer(s) healing?

No

Ulcer(s) improving?

No

Refer

Yes

Continue treatment for a further 7 days

¹Indications for syphilis treatment
- RPR positive; and
- No recent syphilis treatment
²Treat for HSV2 where prevalence is 30% or higher, or adapt to local conditions
Prevalence of Selected STIs among Female Populations in Africa in the 1980’s and 1990’s

Mean Prevalence %

Table of selected 1990’s studies; Wasserheit & Holmes, 1992; Gerbase et al, Lancet 1998
Vaginal discharge syndrome

**VAGINITIS**
- most common causes
- easy to diagnose
  - lab tests
  - clinically
- serious complications?
  - (pregnancy)
  - (endometritis, PID)

**CERVICITIS**
- less common causes
- not easy to diagnose
  - no simple tests
- complications ++
  - PID
  - ectopic pregnancy
  - infertility
Patient complains of vaginal discharge (vaginal itching)

Lower abdominal tenderness or partner symptomatic or specific risk factors positive?  

Yes

Treat for cervical infection plus vaginal infection according to speculum examination findings

No

Speculum and bimanual vaginal exam

Muco-pus from cervix?

• Treat for cervical infections
• Educate, Counsel
• Return if necessary

Profuse vaginal discharge?

• Treat for trichomonas and bacterial vaginosis
• 4 C’s
• Return if necessary

Curd-like vaginal discharge?

• Treat for candida
• Educate/counsel
• Return if necessary

No discharge?

• Educate
• Counsel if needed
• Promote/provide condoms

Cervical motion tenderness present?

Use flow chart for lower abdominal pain
Patient complains of vaginal discharge or vaginal itching

Lower abdominal tenderness or partner symptomatic or specific risk factors positive?

Yes

Treat for cervical infection plus vaginal infection according to speculum exam findings

No

Speculum + bimanual vaginal examinations + wet mount/gram stain microscopy of vaginal specimen

Muco-pus from cervix?

• Treat for cervical infections
  • Educate, Counsel
  • Return if necessary

Trichomonas?

• Treat for trichomonas and bacterial vaginosis
  • 4 C’s
  • Return if necessary

Candida?

• Treat for candida
  • Educate/counsel
  • Return if necessary

No discharge?

Educate
Counsel if needed
Promote/provide condoms

Cervical motion tenderness present?

Use flow chart for lower abdominal pain
Patient complains of vaginal discharge (vaginal itching)

Lower abdominal tenderness or partner symptomatic or risk score positive?*

Yes

- Treat for cervical and vaginal infections
- Educate and counsel
- Return if necessary

No

- Treat for vaginal infections
- Educate
- Counsel if needed
- Promote/provide condoms

* Risk score = any 2 of:
- age <21
- single
- >1 partner in last 3/12
- new partner in last 3/12
Patient complains of vaginal discharge, vulval itching or burning

Take history and examine
Assess risk¹

Abnormal vaginal discharge or vulval erythema?

No

Any other genital disease?

Yes

Use appropriate flowchart for additional treatment

No

Lower abdominal tenderness?

Yes

Vulva oedema/curd-like discharge, erythema, excoriations present?

No

Educate and counsel
Promote condom use and provide condoms
Offer HIV counselling and testing if both facilities are available

TREAT FOR BACTERIAL VAGINOSIS AND TRICHOMONAS VAGINALIS

No

TREAT FOR CANDIDA ALBICANS

¹ Risk factors need adaptation to local social, behavioural and epidemiological situation.
² The determination of high prevalence levels needs to be made locally.
Patient complains of vaginal discharge, vulval itching or burning

Take history and examine patient (external, speculum and bimanual).
Assess risk

Perform wet mount microscopy of vaginal specimen for TV and yeast cells (optional)

Lower abdominal tenderness or cervical motion tenderness present?

Yes

Use flowchart for lower abdominal pain

No

Cervical mucopus or erosions or High GC/CT prevalence setting or risk assessment positive?

Yes

TREAT FOR GONOCOCCAL INFECTION,
CHLAMYDIA TRACHOMATIS,
BACTERIAL VAGINOSIS AND
TRICHOMONAS VAGINALIS.

TREAT FOR BACTERIAL VAGINOSIS AND TRICHOMONAS VAGINALIS

Vulval oedema/curd-like discharge, vulval erythema, excoriations present or yeast cells on microscopy?

Yes

TREAT FOR CANDIDA ALBICANS

No

1. Risk factors need adaptation to local social, behavioural and epidemiological situation
2. The determination of high prevalence levels needs to be made locally
Patient complains of vaginal discharge, vulval itching or burning

Take history and examine patient (external, speculum and bimanual)
Assess risk

Lower abdominal tenderness or cervical motion tenderness present?

Yes

Use flowchart for lower abdominal pain

No

Cervical mucopus or erosions or High GC/CT prevalence setting or risk assessment positive?

Yes

TREAT FOR GONOCCOCAL INFECTION AND CHLAMYDIA TRACHOMATIS
plus vaginal infection according to speculum and microscope examination findings

Perform wet mount/Gram stain microscopy of vaginal specimen

Motile trichomonads

TREAT FOR TRICHOMONAS VAGINALIS

Clue cells seen plus pH>4.5 or KOH positive?

TREAT FOR BACTERIAL VAGINOSIS

Budding yeasts or pseudohyphae seen

TREAT FOR CANDIDA ALIBICANS

No abnormal findings

Educate and counsel • Promote condom use and provide condoms • Manage and treat partner • Offer HIV counselling and testing if both facilities are available • Ask patient to return if necessary

1 Risk factors need adaptation to local social, behavioural and epidemiological situation

2 The determination of high prevalence levels needs to be made locally
1. Pre-requisite information

- Prevalence of STIs
- STI treatment-seeking behaviour
- Treatment practices & counselling (PI6 & PI7)
- Level of (and capacity for) training of implementers
- Drug policy, ordering and distribution system
- Stakeholders involvement
- Review of literature (need ‘evidence criteria’)

IMPLEMENTATION
IMPLEMENTATION

2. Conduct or analyse aetiological studies
   - Genital ulcer syndrome
   - Male genital discharge syndrome
   - Female genital discharge (+/- risk-assessment)
   - Resistance patterns

3. Assess if there is need to depart from WHO or existing national/regional algorithms

4. Adaptation for high/low risk environment
   - high/low prevalence area
   - high risk/low risk populations
5. Determine the role of the laboratory
   - for case management (and monitoring as ‘test of cure’)
   - for screening and case finding
   - for supporting research

6. Determine levels of use/capacity
   - will influence flowchart design & need pre-testing
   - will influence choice of drugs
   - depends on referral patterns
IMPLEMENTATION


- efficacy (cure at least 95% of those infected)
- safety
- cost
- compliance and acceptability
- availability (e.g. at primary health care level)
- use in pregnancy
- broad spectrum (can cover co-existing infections)
- resistance unlikely to occur rapidly
IMPLEMENTATION

8. Printing and distribution (and translation) of flowcharts

9. Training
   - post-service institutional training
   - on-the-job training
   - pre-service training
   - what cadres to train

10. Drug procurement and distribution
IMPLEMENTATION

11. Monitoring and Supervision

WHAT?
- clinical outcomes on returnees and non-returnees
  » cured/ improved/ treatment failures
  » referral/ no follow-up
- Neisseria gonorrhoeae susceptibility
- aetiological surveys
- quality of care (PI6, PI7)

HOW (universal? sentinel sites? standardised protocols? consensual workshops)

WHEN?

12. Evaluation scheme
Monitoring & Evaluation

Evaluate programme and interventions

Assess the epidemic and the response

Train and supervise

Advocate for STI inclusion in the health-care agenda

Strengthen STI programme management and intervention activities

Adopt and adapt evidence-based interventions
Evaluation of Algorithms

- Validity: sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV)
- Feasibility: infrastructure, personnel
- Cost: direct and indirect costs, cost/effectiveness
- Acceptability: health care provider, STI patient, programme manager
Validity of an algorithm (1):

Comparison between:

- Outcome of the algorithm
  - Simulation studies
  - Real outcome in field conditions

- Gold standard diagnosis
  - Laboratory tests
Validity of an algorithm (2)

- Calculation: 2 x 2 table
  - sens, spec, PPV, NPV

- Interpretation: 2 x 2 table
  - correctly treated, over treated, missed infections
## Validity of an algorithm
### Interpretation

### Gold Standard test

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| Total infected | Total not infected |
### Validity of an Algorithm

#### Interpretation

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<td>C: (false -ve)</td>
<td>D: (true -ve)</td>
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<tr>
<td>Total infected</td>
<td>Total non infected</td>
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- **Sensitivity:** $A/A+C$
- **Specificity:** $D/B+D$
- **Positive Predictive Value:** $A/A+B$
- **Negative Predictive Value:** $D/C+D$
COST PER CASE CURED

Total cost of all diagnoses + treatments

Number of cases cured

Cost per case cured decreases if

▲ prevalence increases

▲ specificity of flowchart increases