Rapid HIV testing in the public health setting in North Rhine-Westphalia, 2011-2012

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Background

• North Rhine-Westphalia (NRW) is the federal state with the highest number of HIV infections in Germany
• on behalf of the NRW Ministry of Health, the NRW Centre for Health (Landeszentrum Gesundheit, lzug.nrw) organizes and supports HIV testing by local public health authorities (LPHA)
• 53 LPHA in NRW offer anonymous HIV counselling and testing by laboratory-based screening tests and they have the option to offer additionally or alternatively testing by rapid assays (RA)

Material & Methods

Samples: For the RA (performed in the LPHA) either serum or capillary blood could be used. For screening by chemiluminescence microparticle immunoassay (CMIA) and confirming testing in the laboratory, serum samples were required.

Rapid assay: 24 LPHA used the 3rd generation RA (Vikia® HIV 1/2, bioMérieux Clinical Diagnostics, Marcy L’Etoile, France) based on immuno-chromatography technique (lateral flow) to test their clients for HIV antibodies in the health centres.

Screening test: Samples from all 53 LPHA were tested by CMIA (Architect® HIV Ag/Ab Combo 4th generation HIV test, Abbott Laboratories, Illinois, USA) in a private laboratory (Labor Krone, Bad Salzuflen, Germany).

Confirmatory testing: Reactive RA and CMIA were confirmed by immunoblot analysis (Inno-LiaTM HIV I/II Score, Innogenetics, Gent, Belgium) and in case of negative or borderline immunoblot result, an additional rt-PCR for HIV-1 was done in the laboratory.

Statistics: Clients tested by RA and CMIA were compared according to gender, age, country of origin, risk behaviour and HIV-reactivity.

Results

Comparison of client characteristics
• from 2011 to 2012, the 53 LPHA in NRW tested 24,623 samples from clients by CMIA and 24 LPHA tested 21,513 samples by RA
• clients tested by RA and CMIA were of comparable age with the majority between 20 and 39 years (74% and 72%, respectively)
• clients tested by RA were significantly less often of female gender (Fig.1)
• there was no clear difference between the proportion of men who have sex with men (MSM) among those tested by RA and CMIA
• the proportion of female sex worker (FSW) among those tested by RA was very low
• the proportion of clients from high prevalence countries (HPC) was slightly lower among those tested by RA (Fig.2)

Cases not detected by RA
• at least four early HIV infections (1.4% of all infections) could only be detected by CMIA and not by RA, probably because only p24-antigen was detectable and no antibodies yet
• the client below (Fig. 3) was an MSM who reported flu-like symptoms after a single event of unprotected anal intercourse two weeks prior to the first test

Prevalence of positive test results
• 0.6% of the samples from clients tested by RA were reactive; 1.2% of clients tested by CMIA were reactive in CMIA
• both test systems showed a high specificity (CMIA 99.8% and RA 99.9%)
• these results suggest that probably more clients with a higher risk profile were tested by CMIA than by RA
• after confirmatory testing, 0.8% of all LPHA clients tested for HIV infection were found to be HIV-positive
• confirmed HIV-positive results among MSM: 3.1%, FSW: 0.2%, from HPC: 1.7%

Figure 1: Gender distribution of clients tested either by RA or CMIA

Figure 2: Distribution of risk behaviour and origin

Conclusions

• approximately half of the LPHA in NRW offered the RA additionally to laboratory-based HIV screening by CMIA
• clients tested by RA were slightly different according to age, gender, country of origin, risk behaviour and HIV-reactivity
• it could not be shown so far that by offering RA the LPHA attracted special clients and/or risk groups which might otherwise not have been tested for HIV

• a relatively lower proportion of FSW and clients from HPC were tested by RA, no clear tendency was found for MSM
• among clients tested by CMIA a higher HIV prevalence was detected probably clients with higher risks were preferentially tested by CMIA
• when RA are used for HIV testing in the LPHA, it needs to be considered that some (highly viraemic) acute HIV infections could be detected by CMIA but not by 3rd generation RA