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## Introduction

- In the ANRS IPERGAY trial conducted among high risk MSM : 86% relative reduction of HIV-incidence was reported with on demand PrEP use with TDF/FTC.
- Use of Chemsex drugs is increasingly reported among MSM and is associated with higher risk behavior and lower use of condom.
- All previous studies are based on self-reported consumption data with auto-questionnaires. None of them evaluates qualitatively and quantitatively the prevalence of conventional drugs and new psychoactive substances (NPS) in MSM.

## Methods

- During the ANRS IPERGAY trial, volunteers for substudy were asked every four month to provide hair samples to detect drugs (except the GHB/GBL, poppers and THC for technical reasons).
- When possible (hair length ≥ 3cm and weight ≥ 20mg) a segmental analysis was carried out, 1 cm corresponding to 1 month of drug use.
- After sample pretreatment (external decontamination, lavage and liquid-liquid extraction), a total of 86 molecules including conventional substances (cocaine, amphetamines, opiates), 31 New Psychoactive Substances (NPS) and therapeutics substances were screened by High Resolution mass spectrometry (Q-Exactive®) and quantified using Triple Quadripole TSQ Vantage® (ThermoFisher®) in MRM mode. The method was validated according to European Medicines Agency's guidelines.
- Only patients with NPS and/or conventional drugs detected in hair samples were considered as consumers (excluding therapeutics drugs).

## Results

- 69 volunteers were enrolled, among the 429 pts of the Ipergay study population.
- Baseline characteristics of the study participants are similar to the overall Ipergay population (Table 1).

Table 1. Baseline characteristics of the study participants. Median (IQR) or n (%).

| | | Drug Sub-study population (N=69) | Ipergay Not in drug substudy population (N=360) | P-value |
|---|---|---|---|---|
| Age (years), median, IQR | | 34.7 [28,0- 40,9] | 35,2 [29,3- 42,8] | 0,21 |
| Sexual orientation | Homosexual | 67 (97%) | 347 (96%) | 1 |
| | Bisexual | 2 (3%) | 13 (4%) | |
| Education level – no. (%), Postsecondary | | 45 (65%) | 261 (74%) | 0,28 |
| Unemployed – no. (%), | | 15 (22%) | 44 (12%) | 0,06 |

- A total of 219 hair segments were analyzed.
- 32 molecules were detected : 15 NPS, 9 Therapeutics drugs and 8 Conventional drugs (Table 2).
- NPS and conventional drugs were detected in 77% (53/69) participants.
- NPS (especially cathinones) were detected in 39% (27/69) participants .

Table 2. Molecules detected.

| DRUGS | N Pts | % | | DRUGS | N Pts | % |
|---|---|---|---|---|---|---|
| COCAINE | 47 | 68,1 | | METHOXETAMINE | 4 | 5,8 |
| MDMA | 31 | 44,9 | | PHOLCODINE | 4 | 5,8 |
| KETAMINE | 26 | 37,7 | | METHIOPROPAMINE | 3 | 4,3 |
| SILDENAFIL | 23 | 33,3 | | PMMA | 3 | 4,3 |
| EPHEDRINE | 18 | 26,1 | | MDPV* | 3 | 4,3 |
| TRAMADOL | 15 | 21,7 | | METAMFEPRAMONE* | 2 | 2,9 |
| MEPHEDRONE* | 14 | 20,3 | | VARDENAFIL | 1 | 1,4 |
| 4 MEC* | 12 | 17,4 | | 5F-PB22 | 1 | 1,4 |
| CODEINE | 9 | 13,0 | | METHYLPHENIDATE | 1 | 1,4 |
| NEFOPAM | 7 | 10,1 | | NALMEFENE | 1 | 1,4 |
| TADALAFIL | 7 | 10,1 | | DIPHENIDINE | 1 | 1,4 |
| METHAMPHETAMINE | 6 | 8,7 | | PHENDIMETRAZINE | 1 | 1,4 |
| ETHYLPHENIDATE | 5 | 7,2 | | PHENTERMINE | 1 | 1,4 |
| AMPHETAMINE | 4 | 5,8 | | n-METHYL-2AI | 1 | 1,4 |
| METHYLONE* | 4 | 5,8 | | DIMETHYLONE* | 1 | 1,4 |
| DEXTROMETORPHANE | 4 | 5,8 | | BUTORPHANOL | 1 | 1,4 |

NPS (*cathinones)          Therapeutics drugs          Conventional drugs

- NPS intake was never isolate but associated to cocaine, MDMA or ketamine in 25/27 (93%), 20/27 (74%), and 19/27 (70%) of cases respectively, showing poly-consumptions.
- Segmental hair analysis performed showed wide range exposures, ranging from unique intake (concentration range 5-20 pg/mg) to chronic abuse (>90 ng/mg for amphetamines) but no increase of the quantity of drugs consumed per person in the time, except rare cases.
- No increase of the number of consumers in the time.
- Drugs detection in our study is more important than the self-reported consumption of recreational drugs by questionnaire : 21/53 (39,6%) participants having drugs detected in hair samples didn't declare consumption in questionnaires. (Table 3).

Table 3. Correlation between hair samples and self-reported questionnaires.

| | Hair samples with drugs detected N = 53 | Hair samples without drugs detected N = 16 |
|---|---|---|
| Questionnaires with drugs consumption self-reported | 32/69 (46%) | 2/69 (4%) |
| Questionnaires without drugs consumption self-reported | 21/69 (30%) | 14/69 (20%) |

- MSM pts consuming drugs have more differents partners in past 2 months (p<0,0001) (Table 4)

Table 4. Associations between drugs consumption and other sexual behaviours.

| | Hair samples with drugs detected N = 53 | Hair samples without drugs detected N = 16 | P-value |
|---|---|---|---|
| No. of partners in past 2 months, median, IQR | 7 [4-15] | 5 [2-10] | < 0,0001 |
| No. of sexual acts in past 4 weeks, median, IQR | 10 [5-15] | 9 [4-15] | 0,16 |
| High-risk HIV exposure (only receptive anal sex) : Condomless receptive anal sex : | N =48/53 | N = 16/16 | |
| Yes | 33 | 9 | 0,38 |
| No | 15 | 7 | |
| Hardcore sexual practices | | | |
| Yes | 21 | 4 | 0,38 |
| No | 32 | 12 | |
| Fist sexual practices | | | |
| Yes | 25 | 4 | 0,15 |
| No | 28 | 12 | |

## Conclusion

- Prevalence of NPS and especially synthetic cathinones use in the MSM PrEP population is high but lower than conventional drugs like cocaine and amphetamine, especially MDMA.
- Hair analysis reflects objectively drugs consumption more higher than the self-reported consumption, under-reporting connected with desirability bias, memory or knowledge of actuals products consumed. Observed consumptions suggest to review risk reduction strategy against drug consumption.

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