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NHS Bolton NHS Foundation Trust

Impact of antiretroviral (ARV) and sleep hygiene interventions on sleep disturbance in people living with HIV (PLWH)

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Background:

Sleep disturbance is known to be significantly higher amongst PLWH compared to the general population.[1] Risk factors include psychosocial issues, depression, anxiety, substance misuse and duration of HIV.[1,2] Certain ARVs notably Efavirenz (EFV) are well documented via their neuropsychiatric adverse effects, but also some integrase strand transfer inhibitors (INSTIs) have been reported to be associated with sleep disturbance leading to discontinuation in up to 5% of patients.[3] However there have been few intervention studies addressing switching ARVs from such agents and the overall impact on sleep quality.

Aims and Design:

(Fig 1) We aimed to select patients attending routine bloods monitoring clinic over a 3 month period for intervention using a self reported "sleep screener", asking 4 discriminatory questions. Out of 150 pts sampled, 40 (26%) were identified as having a sleep problem and were further assessed using the Pittsburgh sleep quality index (PSQI), a validated sleep assessment tool [4] consisting of 9 questions covering 7 sleep domains: sleep quality/latency/duration/efficiency/disturbance/medications and daytime dysfunction. These are scored 0-3 each, giving a total composite score of 21. A score of >5 is deemed indicative of significant sleep disturbance. 37 patients (92.5%) scored ≥ 6 and were recruited for interventions. All were given sleep hygiene leaflet plus ARV switch if current regimen was clinically felt to be an aggravating factor and in line with NHSE.

Methods:

A simple non randomised pre-post intervention study with mean global PSQI scores analysed both before and after intervention for total study cohort (n=37), leaflet only (n=20) and ARV switch (n=17) at 2 months and a further 1 year follow up to assess longer term impact. 15/17 ARV switched to Bictegravir/Emtricitabine/Tenofovir alafenamide(B/F/TAF) (Fig 2) from previous DTG, RAL or EFV based regimen (Fig 3).
A separate sub analysis of the cohort reporting past or current mental health problems was also carried out in view of strong association with sleep disturbances.
Statistical analysis using unpaired t test for two tailed p value.

Results:

1.Baseline demographics-Fig 4

Consisting of a stable virologically suppressed cohort. A documented history of past or current mental health problems reported (60%) , was significantly associated with a higher PSQI score indicating more severe sleep disturbance compared to those without (13.45 vs 9.6)

2. Baseline ARVs

INSTIs-67.5%, of which DTG represented 68%. NNRTI 30%, of which EFV 55% and PIs-2.5%. Mean duration on ARVs was 9.6 yrs.

3. Post Intervention PSQI assessment.Total cohort(n=37) (Fig 5)

a. Initially at 2 months -There was significant improvement in PSQI score overall (n=37) of 36%, for leaflet only (n=20) was 20% and ARV switch(n=17) a significant improvement of 54%.

b. Longer term at 12 months - Significant improvement in PSQI score of 38% overall, 26% leaflet only and 53% ARV switch.

4. Post intervention PSQI in mental health sub group(n=22) (Fig 6)

a. Initially at 2 months –There was significant improvement in PSQI score overall of 37% (n=22), leaflet only 22% (n=10) and ARV switch significant improvement of 53%(n=12)

b. Longer term at 12 months-There was significant improvement in PSQI overall of 42%, leaflet only 32% and ARV switch 53%.

Conclusions:

The PSQI questionnaire in conjunction with sleep screening questions identified over 90% of our selected cohort suffering from sleep disturbance, and is a useful tool for assessment of sleep quality in PLWH.
Mental health issues were highly prevalent within the cohort studied (60%) and they had significantly greater sleep disturbance than those without. But were still responsive to the interventions implemented.
A package of interventions including sleep hygiene measures in addition to ARV switch where clinically appropriate significantly improved sleep disturbance. Longer term, these impacts were sustained and in the case of sleep hygiene increased over time.
The greatest impact of > 50% improvement was seen in the ARV switch group, and long term durability suggests a pharmacological effect. Consideration should be given to switching to ARVs with less neuropsychiatric adverse effect in PLWH identified with poor sleep quality.
In line with UNAID's 4th 90% improvement in "good health related quality of life", we recommend routine enquiry of sleep quality and sleep disturbance in PLWH attending clinics.

Fig 1: Design and patient selection for study (n= 37)

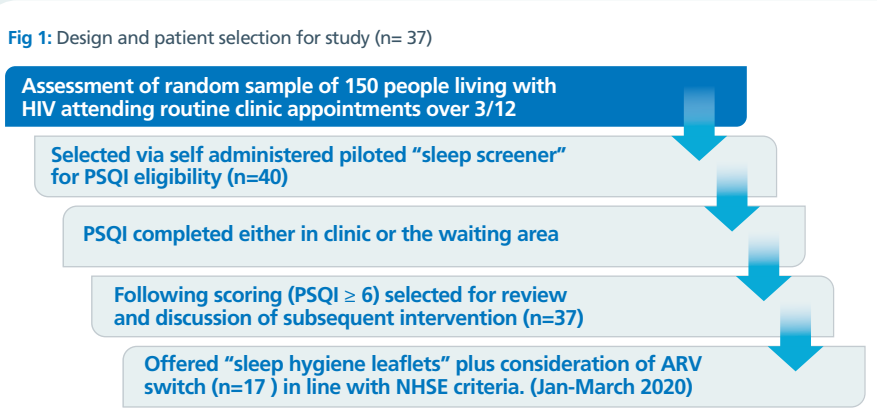


Fig 2: Distribution of sleep hygiene/ARV switch interventions

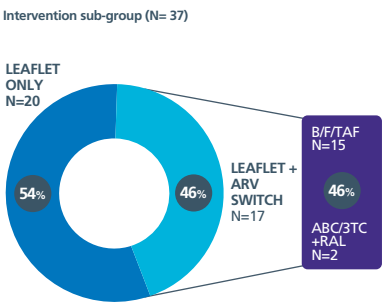


Fig 3: Indivudual ARVs (3rd agent) prior to switch n=17(backbone inset)

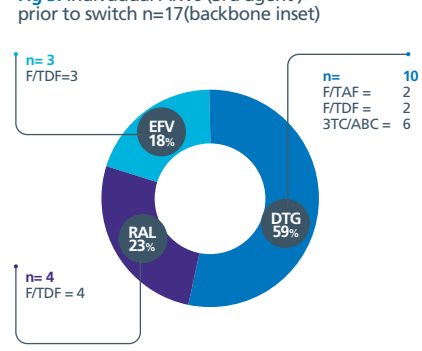


Fig 4: Baseline characteristics/ demographics, n=37 (Mean PSQI score- 12)

Category	Variable(s)	Category	Variable(s)
Mean Age	40 years	Mean ART duration (range)	9.6yrs (2-22)
Female gender	9 (24%)	3rd agent	
Male gender	28 (76%)	INSTI Based	67.5%
BAME	11 (30%)	NNRTI Based	30%
Mental health problems (current/previous)	60%	PI Based	2.5%
HIV VL		NRTI backbone	
<200 copies	92%	F/TAF	5
<50 copies	84%	F/TDF	18
CD4 Count		3TC/ABC	12
Mean	971 cells/mm^3	Other/NRTI sparing	2
<500	81%	Co meds	
		% antidepressants/ antipsychotics	46%
		% with known substance misuse	35%
		Recent (6/12 months) history of STI	35%

Fig 5: Overall PSQI changes (%) following interventions at 2 and 12 months follow up

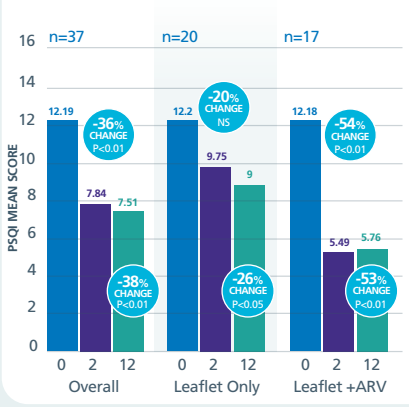
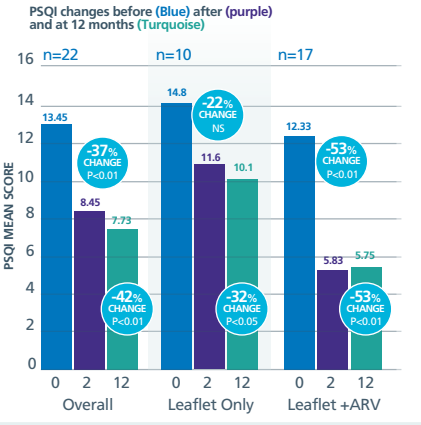


Fig 6: Mental health sub group (n=22) PSQI changes (%) following interventions at 2 and 12 months follow up.



References

Ref 1 Milinkovic A et al.Multimodal assessment of sleep outcomes in PLWH performed using validated sleep questionnaires. Int J of STD and AIDS: 31(10): 996-1003
Ref 2 Insomnia in HIV infection: Psychosomatic Medicine 67(2) :260-269 (2005)
Ref 3 Hoffmann C et al, Higher rates of neuropsychiatric adverse events leading to DTG discontinuation in women and older pts. HIV Medicine(2017), 18, 56-63
Ref 4 Buysse, DJ et al. Psychiatry Research 1989; 28:193-213