Thèse

Pour le

DOCTORAT EN MEDECINE

Diplôme d'État

par

Kévin LEBIGRE

Né(e) 08/04/1987 à Dreux (28)

TITRE :

Trouble de stress post-traumatique chez des patients hospitalisés en soin de suite et de réadaptation en addictologie pour un trouble de l'usage d'alcool : prévalence, association avec les autres comorbidités et impact sur le pronostic addictif

Présentée et soutenue publiquement le **11 octobre 2018** date devant un jury composé de :

Président du Jury : Professeur Nicolas BALLON, Psychiatrie, Addictologie, Faculté de Médecine -Tours

Membres du Jury :

Professeur Wissam EL HAGE, Psychiatrie, Faculté de Médecine – Tours

Professeur Marie GRALL-BRONNEC, Psychiatrie, Addictologie, Faculté de Médecine – Nantes

Docteur Damien MAUGE, Psychiatrie, Addictologie, PH, CHRU Tours

Docteur Servane BARRAULT, Psychologie, MCU, Faculté de Psychologie – Tours

Directeur de thèse : Docteur Paul BRUNAULT, Psychiatrie, Addictologie, MCU-PH, Faculté de médecine – Tours

UNIVERSITE FRANCOIS RABELAIS
FACULTE DE MEDECIINE DE TOURS

DOYEN
Pr. Patrice DIOT

VICE-DOYEN
Pr. Henri MARRET

ASSESSEURS
Pr. Denis ANGOULVANT, *Pédagogie*
Pr. Mathias BUCHLER, *Relations internationales*
Pr. Hubert LARDY, *Moyens – relations avec l'Université*
Pr. Anne-Marie LEHR-DRYLEWICZ, *Médecine générale*
Pr. François MAILLOT, *Formation Médicale Continue*
Pr. Patrick VOURC'H, *Recherche*

SECRETAIRE GENERALE
Mme Fanny BOBLETER
****
DOYENS HONORAIRES
Pr. Emile ARON (†) – *1962-1966*
Directeur de l'Ecole de Médecine - 1947-1962
Pr. Georges DESBUQUOIS (†) - *1966-1972*
Pr. André GOUAZE - *1972-1994*
Pr. Jean-Claude ROLLAND – *1994-2004*
Pr. Dominique PERROTIN – *2004-2014*

PROFESSEURS EMERITES
Pr. Daniel ALISON
Pr. Philippe ARBEILLE
Pr. Catherine BARTHELEMY
Pr. Christian BONNARD
Pr. Philippe BOUGNOUX
Pr. CHANTEPIE
Pr. Pierre COSNAY
Pr. Etienne DANQUECHIN-DORVAL
Pr. Loïc DE LA LANDE DE CALAN
Pr. Noël HUTEN
Pr. Olivier LE FLOCH
Pr. Yvon LEBRANCHU
Pr. Elisabeth LECA
Pr. Anne-Marie LEHR-DRYLEWICZ
Pr. Gérard LORETTE
Pr. Roland QUENTIN
Pr. Alain ROBIER
Pr. Elie SALIBA

PROFESSEURS HONORAIRES
ANTHONIOZ – A. AUDURIER – A. AUTRET – P. BAGROS – P.BARDOS – J.L. BAULIEU – C. BERGER – JC. BESNARD – P. BEUTTER – P. BONNET – M. BROCHIER – P. BURDIN – L. CASTELLANI – B. CHARBONNIER – P. CHOUTET – T. CONSTANS – C. COUET - J.P. FAUCHIER – F. FETISSOF – J. FUSCIARDI – P. GAILLARD – G. GINIES – A. GOUAZE – J.L. GUILMOT – M. JAN – J.P. LAMAGNERE – F. LAMISSE – Y. LANSON – J. LAUGIER – P. LECOMTE – E. LEMARIE – G. LEROY – Y. LHUINTRE – M. MARCHAND – C. MAURAGE – C. MERCIER – J. MOLINE – C. MORAINE – J.P. MUH – J. MURAT – H. NIVET – L. POURCELOT – P. RAYNAUD – D. RICHARD-LENOBLE – J.C. ROLLAND – D. ROYERE - A. SAINDELLE – J.J. SANTINI – D. SAUVAGE – D. SIRINELLI – B. TOUMIEUX – J. WEILL

PROFESSEURS DES UNIVERSITES - PRATICIENS HOSPITALIERS

ANDRES Christian .... Biochimie et biologie moléculaire
ANGOULVANT Denis .... Cardiologie
AUPART Michel .... Chirurgie thoracique et cardiovasculaire
BABUTY Dominique .... Cardiologie
BALLON Nicolas .... Psychiatrie ; addictologie
BARILLOT Isabelle .... Cancérologie ; radiothérapie
BARON Christophe .... Immunologie
BEJAN-ANGOULVANT Théodora .... Pharmacologie clinique
BERNARD Anne .... Cardiologie
BERNARD Louis .... Maladies infectieuses et maladies tropicales
BLANCHARD-LAUMONNIER Emmanuelle ...... Biologie cellulaire
BLASCO Hélène …………………………………. Biochimie et biologie moléculaire
BODY Gilles .... Gynécologie et obstétrique
BONNARD Christian .... Chirurgie infantile
BONNET-BRILHAULT Frédérique .... Physiologie
BRILHAULT Jean .... Chirurgie orthopédique et traumatologique
BRUNEREAU Laurent .... Radiologie et imagerie médicale
BRUYERE Franck .... Urologie
BUCHLER Matthias .... Néphrologie
CALAIS Gilles .... Cancérologie, radiothérapie
CAMUS Vincent .... Psychiatrie d'adultes
CHANDENIER Jacques .... Parasitologie, mycologie
COLOMBAT Philippe .... Hématologie, transfusion
CORCIA Philippe .... Neurologie
COTTIER Jean-Philippe..................................... Radiologie et imagerie médicale
DE TOFFOL Bertrand .... Neurologie
DEQUIN Pierre-François.................................... Thérapeutique
DESOUBEAUX Guillaume ………………………. Parasitologie et mycologie
DESTRIEUX Christophe .... Anatomie
DIOT Patrice .... Pneumologie
DU BOUEXIC de PINIEUX Gonzague .... Anatomie & cytologie pathologiques
DUCLUZEAU Pierre-Henri .... Endocrinologie, diabétologie, et nutrition
DUMONT Pascal... Chirurgie thoracique et cardiovasculaire
EL HAGE Wissam... Psychiatrie adulte
EHRMANN Stephan .... Réanimation
FAUCHIER Laurent .... Cardiologie
FAVARD Luc .... Chirurgie orthopédique et traumatologique
FOUGERE Bertrand ……………………………… Gériatrie
FOUQUET Bernard .... Médecine physique et de réadaptation
FRANCOIS Patrick.. Neurochirurgie
FROMONT-HANKARD Gaëlle .... Anatomie & cytologie pathologiques
GAUDY-GRAFFIN Catherine ………………….. Bactériologie-virologie, hygiène hospitalière
GOGA Dominique .... Chirurgie maxillo-faciale et stomatologie
GOUPILLE Philippe .... Rhumatologie
GRUEL Yves .... Hématologie, transfusion
GUERIF Fabrice .... Biologie et médecine du développement et de la reproduction
GUYETANT Serge .... Anatomie et cytologie pathologiques
GYAN Emmanuel .... Hématologie, transfusion
HAILLOT Olivier .... Urologie
HALIMI Jean-Michel .... Thérapeutique
HANKARD Régis .... Pédiatrie
HERAULT Olivier .... Hématologie, transfusion
HERBRETEAU Denis .... Radiologie et imagerie médicale
HOURIOUX Christophe .... Biologie cellulaire
LABARTHE François .... Pédiatrie

LAFFON Marc .... Anesthésiologie et réanimation chirurgicale, médecine d'urgence
LARDY Hubert .... Chirurgie infantile
LARIBI Saïd .... Médecine d'urgence
LARTIGUE Marie-Frédérique............................. Bactériologie-virologie
LAURE Boris .... Chirurgie maxillo-faciale et stomatologie
LECOMTE Thierry .... Gastroentérologie, hépatologie
LESCANNE Emmanuel...................................... Oto-rhino-laryngologie
LINASSIER Claude .... Cancérologie, radiothérapie
MACHET Laurent .... Dermato-vénéréologie
MAILLOT François .... Médecine interne
MARCHAND-ADAM Sylvain .... Pneumologie
MARRET Henri .... Gynécologie-obstétrique
MARUANI Annabel .... Dermatologie-vénéréologie
MEREGHETTI Laurent .... Bactériologie-virologie ; hygiène hospitalière
MORINIERE Sylvain .... Oto-rhino-laryngologie
MOUSSATA Driffa .... Gastro-entérologie
MULLEMAN Denis .... Rhumatologie
ODENT Thierry .... Chirurgie infantile
OUAISSI Mehdi .... Chirurgie digestive
OULDAMER Lobna .... Gynécologie-obstétrique
PAGES Jean-Christophe .... Biochimie et biologie moléculaire
PAINTAUD Gilles .... Pharmacologie fondamentale, pharmacologie clinique
PATAT Frédéric .... Biophysique et médecine nucléaire
PERROTIN Dominique .... Réanimation médicale, médecine d'urgence
PERROTIN Franck .... Gynécologie-obstétrique
PISELLA Pierre-Jean .... Ophtalmologie
PLANTIER Laurent .... Physiologie
QUENTIN Roland .... Bactériologie-virologie, hygiène hospitalière
REMERAND Francis .... Anesthésiologie et réanimation, médecine d'urgence
ROINGEARD Philippe .... Biologie cellulaire
ROSSET Philippe .... Chirurgie orthopédique et traumatologique
RUSCH Emmanuel .... Epidémiologie, économie de la santé et prévention
SAINT-MARTIN Pauline .... Médecine légale et droit de la santé
SALAME Ephrem .... Chirurgie digestive
SAMIMI Mahtab .... Dermatologie-vénéréologie
SANTIAGO-RIBEIRO Maria................................ Biophysique et médecine nucléaire
THOMAS-CASTELNAU Pierre .... Pédiatrie
TOUTAIN Annick .... Génétique
VAILLANT Loïc .... Dermato-vénéréologie
VELUT Stéphane .... Anatomie
VOURC'H Patrick .... Biochimie et biologie moléculaire
WATIER Hervé .... Immunologie

PROFESSEUR DES UNIVERSITES DE MEDECINE GENERALE

LEBEAU Jean-Pierre

PROFESSEURS ASSOCIES

MALLET Donatien .... Soins palliatifs
POTIER Alain .... Médecine Générale
ROBERT Jean .... Médecine Générale

MAITRES DE CONFERENCES DES UNIVERSITES - PRATICIENS HOSPITALIERS

BAKHOS David .... Physiologie
BARBIER Louise .... Chirurgie digestive
BERHOUET Julien .... Chirurgie orthopédique et traumatologique
BERTRAND Philippe .... Biostatistiques, informatique médical et technologies de communication
BRUNAULT Paul .... Psychiatrie d'adultes, addictologie
CAILLE Agnès .... Biostatistiques, informatique médical et technologies de communication
CLEMENTY Nicolas .... Cardiologie
DOMELIER Anne-Sophie .... Bactériologie-virologie, hygiène hospitalière
DUFOUR Diane .... Biophysique et médecine nucléaire
FAVRAIS Géraldine ……………………………. Pédiatrie
FOUQUET-BERGEMER Anne-Marie .... Anatomie et cytologie pathologiques
GATAULT Philippe .... Néphrologie
GOUILLEUX Valérie .... Immunologie
GUILLON Antoine .... Réanimation
GUILLON-GRAMMATICO Leslie .... Epidémiologie, économie de la santé et prévention
HOARAU Cyrille .... Immunologie
IVANES Fabrice .... Physiologie
LE GUELLEC Chantal .... Pharmacologie fondamentale, pharmacologie clinique
MACHET Marie-Christine .... Anatomie et cytologie pathologiques
MOREL Baptiste ……………………………….Radiologie pédiatrique
PIVER Éric .... Biochimie et biologie moléculaire
REROLLE Camille .... Médecine légale
ROUMY Jérôme .... Biophysique et médecine nucléaire
SAUTENET Bénédicte ……………………………Néphrologie
TERNANT David .... Pharmacologie fondamentale, pharmacologie clinique
ZEMMOURA Ilyess .... Neurochirurgie

MAITRES DE CONFERENCES DES UNIVERSITES

AGUILLON-HERNANDEZ Nadia .... Neurosciences
BOREL Stéphanie .... Orthophonie
DIBAO-DINA Clarisse .... Médecine Générale
MONJAUZE Cécile .... Sciences du langage - orthophonie
PATIENT Romuald .... Biologie cellulaire
RENOUX-JACQUET Cécile .... Médecine Générale

CHERCHEURS INSERM - CNRS – INRA

BOUAKAZ Ayache .... Directeur de Recherche INSERM – UMR INSERM 930
CHALON Sylvie .... Directeur de Recherche INSERM – UMR INSERM 930
COURTY Yves .... Chargé de Recherche CNRS – UMR INSERM 1100
DE ROCQUIGNY Hugues .... Chargé de Recherche INSERM – UMR INSERM 966
ESCOFFRE Jean-Michel .... Chargé de Recherche INSERM – UMR INSERM 930
GILOT Philippe .... Chargé de Recherche INRA – UMR INRA 1282
GOUILLEUX Fabrice... Directeur de Recherche CNRS – UMR CNRS 7292
GOMOT Marie... Chargée de Recherche INSERM – UMR INSERM 930
HEUZE-VOURCH Nathalie .... Chargée de Recherche INSERM – UMR INSERM 1100
KORKMAZ Brice .... Chargé de Recherche INSERM – UMR INSERM 1100

LAUMONNIER Frédéric .... Chargé de Recherche INSERM - UMR INSERM 930
LE PAPE Alain .... Directeur de Recherche CNRS – UMR INSERM 1100
MAZURIER Frédéric .... Directeur de Recherche INSERM – UMR CNRS 7292
MEUNIER Jean-Christophe .... Chargé de Recherche INSERM – UMR INSERM 966
PAGET Christophe .... Chargé de Recherche INSERM – UMR INSERM 1100
RAOUL William .... Chargé de Recherche INSERM – UMR CNRS 7292
SI TAHAR Mustapha .... Directeur de Recherche INSERM – UMR INSERM 1100
WARDAK Claire .... Chargée de Recherche INSERM – UMR INSERM 930

CHARGES D'ENSEIGNEMENT

Pour l'Ecole d'Orthophonie
DELORE Claire .... Orthophoniste
GOUIN Jean-Marie .... Praticien Hospitalier
PERRIER Danièle .... Orthophoniste

Pour l'Ecole d'Orthoptie
LALA Emmanuelle .... Praticien Hospitalier
MAJZOUB Samuel .... Praticien Hospitalier

Pour l'Ethique Médicale
BIRMELE Béatrice .... Praticien Hospitalier

SERMENT D'HIPPOCRATE

En présence des Maîtres de cette Faculté,
de mes chers condisciples
et selon la tradition d'Hippocrate,
je promets et je jure d'être fidèle aux lois de l'honneur
et de la probité dans l'exercice de la Médecine.

Je donnerai mes soins gratuits à l'indigent,
et n'exigerai jamais un salaire au-dessus de mon travail.

Admis dans l'intérieur des maisons, mes yeux
ne verront pas ce qui s'y passe, ma langue taira
les secrets qui me seront confiés et mon état ne servira
pas
à corrompre les mœurs ni à favoriser le crime.

Respectueux et reconnaissant envers mes Maîtres,
je rendrai à leurs enfants
l'instruction que j'ai reçue de leurs pères.

Que les hommes m'accordent leur estime
si je suis fidèle à mes promesses.
Que je sois couvert d'opprobre
et méprisé de mes confrères
si j'y manque.

A Monsieur le Professeur Nicolas BALLON

Professeur des Universités en Psychiatrie et en Addictologie à la Faculté de Médecine de Tours

Praticien Hospitalier de l'Equipe de Liaison en Soins en Addictologie au CHRU de Tours

Chef de pôle de Psychiatrie et d'Addictologie du CHRU de Tours

Je vous remercie d'avoir accepté d'être le président du jury de cette thèse.

Je vous remercie de votre enseignement et de votre disponibilité lors de mon stage sur l'ELSA.

Veuillez recevoir ici l'expression de ma plus sincère gratitude et de mon plus profond respect.

A Monsieur le Professeur Wissam EL-HAGE

Professeur des Universités en Psychiatrie à la Faculté de Médecine de Tours

Praticien Hospitalier du service de la Clinique Psychiatrique Universitaire du CHRU de Tours

Vous me faites l'honneur d'accepter de juger cette thèse.

Vous avez en grande partie contribué à ce travail en ayant coordonné la réalisation de l'étude présentée et je vous en remercie.

Je vous remercie de la qualité de votre enseignement dont j'ai pu bénéficier en cours et lors de mon stage sur la CPU.

Veuillez recevoir ici l'expression de ma plus sincère gratitude et de mon plus profond respect.

A Madame le Professeur Marie GRALL-BRONNEC

Professeur des Universités en Psychiatrie et en addictologie à la Faculté de Médecine de Nantes

Praticien Hospitalier de l'équipe de Liaison et en Soins en Addictologie au CHRU de Tours

Vous me faites l'honneur d'accepter de juger mon travail.

Je vous remercie également pour la qualité de votre enseignement dont j'ai pu bénéficier lors du DESC d'addictologie à Nantes.

Veuillez recevoir ici l'expression de toute ma gratitude et de mon plus profond respect.

A Monsieur le Docteur Paul BRUNAULT

Maître de Conférences des Universités, Praticien Hospitalier en Psychiatrie et en Addictologie au sein de l'Equipe de Liaison et de Soin en Addictologie au CHRU de Tours

Vous me faites l'honneur d'accepter de juger mon travail.

Vous avez coordonné l'ensemble de la réalisation de ma thèse.

Sans votre investissement, ce travail n'aurait pas existé.

Mille merci.

Veuillez recevoir ici l'expression de ma plus sincère gratitude et mon plus profond respect.

A Monsieur le Docteur Damien MAUGE

Médecin coordinateur du CSAPA d'Indre et Loire,

Praticien Hospitalier en Psychiatrie et en Addictologie au sein de l'Equipe de Liaison et de Soins en Addictologie

Vous me faites l'honneur d'accepter de juger mon travail.

Vous avez en grande partie contribué à ce travail en ayant coordonné la réalisation de l'étude présentée et je vous en remercie.

Toute ma reconnaissance pour la qualité de votre enseignement dont j'ai pu bénéficier au cours de mon stage sur l'ELSA 37 et au CSAPA de Loches.

Veuillez recevoir ici l'expression de ma plus sincère gratitude et mon plus profond respect.

11

A Madame le Docteur Servane BARRAULT

Maître de Conférences des Universités à la Faculté de Psychologie de Tours

Psychologue clinicienne au CSAPA de Port-Bretagne

Tu me fais l'honneur d'accepter de juger mon travail.

Je te remercie pour ton regard critique, de m'avoir prodigué de bons conseils et d'avoir répondu présente à toutes mes questions.

Reçois ici l'expression de ma plus sincère gratitude et mon plus profond respect.

Remerciements personnels

Je tiens également à remercier ceux qui m'ont accompagné tout au long de ma vie, mes études et mes stages, sans lesquels je ne serais pas devenu la personne que je suis.

A mes parents : *Frédéric* et *Nathalie* qui ont toujours crus en moi. Vous m'avez soutenu sur tous les plans depuis toujours bien que ma scolarité n'ait pas toujours été brillante. Je vous en serai infiniment reconnaissant.

A ma sœur *Mégane*, son mari *Quentin* et ses enfants *Melvyn* et *Emy*. Vous formez une si belle famille. Vous voir vous épanouir participe à mon bonheur.

A ma grand-mère *Bernadette*. En te remerciant de tout tes soutiens pendant ces longues et dures années et bien sûr en te remerciant des nombreuses fois où tu es venue me chercher à Tours pendant mes deux premières années de médecine.

A tout le reste de ma famille

A mes amis les plus proches : *Adrien*, *Julie*, *Alexandre* et *Hélène*. Nous nous connaissons depuis le lycée et nous avons traversé tant d'épreuves ensemble. Désormais la page estudiantine se tourne et nous touchons de plus près les rêves dont on a tant parlé. J'espère que nous resterons soudés pour encore très longtemps.

A tous mes autres amis : *Diana*, *Ségolène*, *Lorraine*, *Sara*, *Camille*, *Cécilia*, *Sophie*, *Romain*, *Valérian*, *Gaëlle*, *Greg* et tant d'autres.

A toutes les équipes soignantes que j'ai côtoyées pendant mon internat. Je vous remercie de vos conseils, de vos critiques et aussi des bons moments partagés ensemble.

A *Hussein* pour m'avoir donné de sacrés coups de mains pendant ma thèse

A tous les patients que j'ai pu croiser pendant mon internat qui au-delà de la souffrance m'ont tant appris sur la psychiatrie et ce qu'est être humain.

Résumé

Contexte : Si le trouble de stress post-traumatique (TSPT) est fortement associé aux addictions, la plupart des études se sont focalisées sur une addiction en particulier, notamment sur le seul Trouble de l'Usage d'Alcool (TUA). De plus, peu ont investigué le lien entre amélioration du TSPT et amélioration des addictions. Cette thèse article avait deux objectifs : (1) évaluer le lien entre TSPT et différents troubles addictifs (alcool, tabac, cannabis, jeu d'argent pathologique, alimentation) chez des fonctionnaires de police hospitalisés pour un TUA (article 1) ; (2) préciser, parmi les patients ayant un TSPT en début d'hospitalisation, combien étaient en rémission en fin d'hospitalisation et quels étaient les facteurs associés à cette rémission.

Méthode : Cette étude mono-centrique (centre de Soins de Suite et de Réadaptation en Addictologie du Courbat, Indre-et-Loire, menée entre Janvier 2016 et Octobre 2017) et longitudinale comportait deux temps d'évaluation : après une semaine d'hospitalisation (T1) et en fin d'hospitalisation (T2= 2 mois après T1). Des auto-questionnaires administrés à T1 et T2 ont permis d'évaluer les variables sociodémographiques, les troubles addictifs (AUDIT, Fagerström, CAST, mYFAS, ICJE) et la sévérité et le type de TSPT (LEC-5, PCL-5, CTQ).

Résultats : Étude 1 (transversale, fonctionnaires de police ayant un TUA, n=133) : le TSPT était fortement prévalent chez les fonctionnaires de police hospitalisés pour un TUA (38,3%). Le TSPT était associé à un TUA plus sévère et à une prévalence plus élevée de trouble de l'usage du tabac et d'addiction à l'alimentation, mais pas de trouble lié à l'usage de cannabis ou de jeu d'argent pathologique. Étude 2 (longitudinale, patients ayant un TSPT à T1 et suivis à T2, n=91) : le taux de rémission du TSPT au cours de l'hospitalisation (amélioration d'au moins 30% du score CAPS entre T1 et T2) était de 74,7%. Le facteur prédicteur d'une moins bonne évolution du TSPT (absence de rémission) était l'existence de traumatismes infantiles, mais pas le type de traumatismes, l'intensité du TSPT, ni la sévérité initiale du TUA. Une rémission du TSPT était associée à une amélioration de la sévérité du TUA, tandis que l'absence de rémission était associée à une absence d'amélioration de la sévérité du TUA.

Conclusion : Il est fondamental de dépister et de prendre en charge le TSPT chez les patients hospitalisés en SSR-A pour un TUA : ce trouble est associé à de nombreuses addictions (sévérité du TUA, tabac, alimentation), et son amélioration est associée à une amélioration de la sévérité du TUA. Parmi les patients souffrant de TSPT, ceux ayant des traumatismes infantiles ont la moins bonne évolution, soulignant l'intérêt d'une prise en charge spécifique de ces patients.

Mots-clés : Trouble de stress post-traumatique ; Trouble de l'usage d'alcool ; Addictions ; Traumatismes infantiles ; Facteurs prédicteurs ; Evolution ; Policiers

Abstract

Context: Although posttraumatic stress disorder (PTSD) is strongly associated with addictive disorders, most studies are focused on one addictive disorder, especially on alcohol use disorder alone =AUD. Furthermore, few have investigated the link between PTSD improvement and addictive disorders improvement. This article thesis had two objectives: (1) assess the link between PTSD and a range of addictive disorders (alcohol, tobacco, cannabis, gambling, food addiction) in police officers hospitalized for an AUD (article 1); (2) precise, among patients suffering from PTSD at the beginning of the hospitalization how many was remitted at the end of the hospitalization, what's was predictive factors associated with this remission.

Method: This monocentric study (Rehabilitation center for addictive disorders of the Courbat, Indre-et-Loire, conducted between January 2016 and October 2017) and longitudinal include two times of assessment: after one week of hospitalization (T1) and at the end of the hospitalization (T2= 2 months after T1). Self-administered questionnaires at T1 and T2 assessed sociodemographic variables, addictive disorders (AUDIT, Fagerström, CAST, mYFAS, CGPI) and severity and type of PTSD (LEC-5, PCL-5, CTQ).

Results: Study 1 (cross-sectional, police officers suffering from AUD, n=133): posttraumatic stress disorder was strongly prevalent in police officers suffering from AUD (38.3%). PTSD was associated with more severe AUD and a highly prevalence for tobacco use disorder and food addiction but not with cannabis use disorder nor gambling disorder. Study 2 (longitudinal, patients suffering from PTSD at T1 followed at T2, n=91): remitted PTSD rate (improvement of at least 30% CAPS score between T1 et T2) during hospitalization was 74.7%. Predictive factors of worst PTSD evolution (absence of remission) was the existence of childhood trauma, but not type of trauma, PTSD intensity, nor initial severity of AUD. PTSD remission was associated with AUD severity improvement, while absence of remission was associated with an absence of AUD severity improvement.

Conclusion: It is fundamental to screen for and treat PTSD in patients suffering from AUD and hospitalized in rehabilitation center for addictive disorders: this disorder is associated to several addictions (Severity of AUD, tobacco, food), and it's improvement is associated with an improvement of AUD severity. Among patients suffering from PTSD, those with childhood trauma have the worst evolution, highlight the importance of specific management of these patients.

Key words: Posttraumatic stress disorder; Alcohol use disorder; Addictions; Childhood trauma; Predictive factors; Evolution; Police officers

SOMMAIRE

INTRODUCTION

Le trouble de stress posttraumatique (TSPT) est un enjeu majeur de santé publique. Il s'agit d'un trouble fortement comorbide avec d'autres troubles psychiatriques, en particulier les troubles addictifs comme le trouble de l'usage d'alcool (Hingray, Cohn, et al., 2018; McCauley, Killeen, Gros, Brady, & Back, 2012; Ouimette, Read, Wade, & Tirone, 2010). La prévalence sur la vie entière du TSPT dans la population générale est d'environ 8% alors que chez les sujets ayant un trouble de l'usage de substance, la prévalence est de 30 à 60% (Gielen, Havermans, Tekelenburg, & Jansen, 2012; Kessler et al., 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

Les interactions entre le TSPT et les troubles addictifs sont bidirectionnelles. D'une part, le TSPT peut se compliquer de troubles addictifs et, d'autre part, l'abus de substance expose au risque de psycho-traumatisme. L'usage de substances psychoactives lors d'un trouble de stress posttraumatique est souvent conceptualisé comme un moyen de faire face aux symptômes intrusifs de cette pathologie (Chilcoat & Breslau, 1998; Vujanovic, Marshall-Berenz, & Zvolensky, 2011). L'existence du double diagnostic TSPT / Trouble de l'usage d'alcool comporte cependant certaines particularités. Par exemple, l'arrêt de l'usage de l'intoxication éthylique seule peut aggraver le diagnostic. En revanche, traiter les deux troubles au sein de thérapies intégrées pourrait aboutir à une guérison ; à l'instar d'autres troubles psychiatriques comme le trouble bipolaire ou la schizophrénie (Najavits, 2005).

En amont de ces troubles existent des facteurs de risque susceptibles d'induire une vulnérabilité chez les patients souffrant de trouble de l'usage d'alcool et de TSPT. Parmi eux, les psycho-traumatismes infantiles. L'existence de traumatismes survenus précocement chez un individu peuvent altérer durablement sa personnalité et ses capacités à faire face à certaines difficultés comme l'exposition à un futur traumatisme à l'âge adulte (Brady & Back,

2012; Lotzin, Haupt, von Schönfels, Wingenfeld, & Schäfer, 2016; Müller et al., 2018; Spinhoven, Penninx, van Hemert, de Rooij, & Elzinga, 2014; Tubman, Oshri, Taylor, & Morris, 2011).

D'autre part, les traumatismes infantiles auraient aussi un impact non négligeable sur le développement du système nerveux autonome, le rendant plus réactif et sensible à la réponse à un stress (Etain et al., 2010, 2010; O'Hare, McCrory, O'Leary, O'Brien, & Kenny, 2017). De nombreuses études antérieures rapportent un lien étroit entre le trouble de l'usage d'alcool et le trouble de stress posttraumatique chez les individus ayant un ou plusieurs traumatismes infantiles (Bailey & McCloskey, 2005; Hingray, Cohn, et al., 2018; Huang, Schwandt, Ramchandani, George, & Heilig, 2012).

Parmi les populations concernées par le trouble de stress posttraumatique et le trouble de l'usage d'alcool se trouvent les policiers. Les forces de l'ordre sont susceptibles d'être plus fréquemment exposées que la population générale à de potentiels psycho-traumatismes comme des agressions physiques ou d'être témoin d'une scène difficile comme l'exposition à la mort (Ballenger et al., 2011; Carlier, Lamberts, & Gersons, 1997; Marmar et al., 2006).

Afin de mieux comprendre les liens entre TSPT et TUA, ce travail se propose d'étudier les interactions entre TSPT et TUA au sein de la population générale et auprès de fonctionnaires de police. Pour ce faire, cette thèse s'est focalisée sur une étude réalisée dans le Centre de Soins et de Réadaptation en Addictologie (SSRA) du Courbat, situé en Indre-et-Loire. Ce travail a débuté en 2016 sous l'impulsion d'une collaboration entre le SSR-A du Courbat (Frédérique Yonnet puis Sarah Trotet), le CHU/CSAPA-37 de Tours et l'Université de Tours (Pr Nicolas Ballon, Pr Wissam El-Hage, et Dr Damien Maugé). L'objectif de ce travail était de préciser la prévalence du TSPT dans cette population, de préciser les profils addictologiques et psychopathologiques de ces patients, et d'observer leur évolution au

décours de leur hospitalisation. Le centre du Courbat est en effet un lieu unique en France, dans la mesure où il accueille des membres des Ministères de la Justice, de la Défense et de l'Intérieur (comme les policiers) souffrant de trouble de l'usage de substances (dont l'alcool) et/ou d'épuisement professionnel, et ce, en complément d'un accueil des patients de la population générale souffrant de troubles addictifs. En tant qu'ESPIC (établissement de Santé Public d'Intérêt Collectif) et en tant que membre du GHT-37, cette structure est en effet également ouverte aux patients français n'étant pas fonctionnaires de ces ministères, qu'il s'agisse de patients de la région Centre-Val de Loire ou d'autres régions françaises.

Ce travail, composé de deux articles scientifiques originaux, s'appuie sur l'étude PAACT (Prévalence Addiction, Anas, Courbat, Trouble de stress posttraumatique) qui a évalué les troubles addictifs, le TSPT et les comorbidités psychiatriques et non psychiatriques associées (anxiété, dépression, estime de soi et la qualité de vie). Le but principal (initial) de cette étude était d'établir la prévalence du TSPT au sein de la population hospitalisée au Courbat et d'établir chez ses patients leur profil de comorbidités associé ainsi que les facteurs influant sur son évolution ; afin de mieux définir les besoins des patients pour leur proposer la meilleure prise en charge individualisée et intégrée possible.

Afin de mieux répondre aux demandes de ces patients, nous nous sommes demandé dans un premier article se focalisant chez les policiers admis au Courbat si la présence d'un trouble de stress posttraumatique à l'admission était un facteur prédicteur de certaines addictions, en prenant en compte un large spectre de troubles addictifs (alcool, tabac, cannabis, mais aussi jeu et alimentation). Dans un second article prenant en compte l'ensemble de la file active des patients admis au Courbat, nous avons étudié, chez les patients ayant un TSPT à l'arrivée, quels étaient les facteurs associés à l'évolution positive du TSPT au cours du séjour (définie par l'amélioration d'au moins 30% du score de l'échelle PCL-5 , Ashbaugh et al, 2016), et quel lien il pouvait y avoir avec l'évolution de la sévérité du TUA.

Nous faisions l'hypothèse que la présence de psycho-traumatismes infantiles était le facteur principal associé à une moins bonne évolution du TSPT, et que l'évolution du TSPT était liée à la sévérité du TUA.

PREMIER ARTICLE (en anglais): Posttraumatic stress disorder is a risk factor for multiple addictions in police officers admitted for alcohol use disorder

(Submitted to Psychology of Addictive Behaviors)

Titre en Français : Le trouble de stress posttraumatique est un facteur de risque pour de multiples addictions chez les fonctionnaires de police hospitalisés pour un trouble de l'usage de l'alcool.

Authors: Paul Brunault[1,2,3,4], Kévin Lebigre[1,2], Fatima Idbrik[5], Damien Maugé[1,6], Philippe Adam[5], Hussein El Ayoubi[1,6,10], Coraline Hingray[6], Servane Barrault[4,6], Marie Grall-Bronnec[8,9], Nicolas Ballon[1,2,4], Wissam El-Hage[2,3]

Institutional affiliations:

[1] CHRU de Tours, Équipe de Liaison et de Soins en Addictologie, Tours, France

[2] CHRU de Tours, Clinique Psychiatrique Universitaire, Tours, France

[3] UMR 1253, iBrain, Université de Tours, INSERM, Tours, France

[4] Université de Tours, Département de Psychologie, EA 2114 « Psychologie des Âges de la Vie et adaptation », Tours, France.

[5] Soins de Suite et de Réadaptation en Addictologie "Le Courbat", Le Liège, France

[6] CHRU de Tours, CSAPA-37, Tours, France

[7] Pôle Universitaire du Grand Nancy, Centre Psychothérapique de Nancy, Laxou, France

[8] CHU Nantes, Addictology and Psychiatry Department, Nantes, France

[9] Université de Nantes, INSERM U1246, Nantes, France

[10] Centre Hospitalier Louis Sevestre, La Membrolle-sur-Choisille, France

RESUME

Introduction : Parmi les fonctionnaires de police, le trouble de stress posttraumatique (TSPT) est associé avec le trouble de l'usage d'alcool, mais nous manquons de données sur l'association entre le TSPT et les troubles liés aux substances et aux addictions. Nous avons cherché à déterminer si le TSPT pouvait constituer un facteur de risqué pour différente troubles addictifs chez les fonctionnaires de police, incluant l'alcool, tabac, cannabis, jeu d'argent pathologique et l'alimentation.

Méthodes : Cette étude transversale a inclus tous les fonctionnaires de police pour un trouble de l'usage d'alcool dans un service de soin de suite et de réadaptation en addictologie dédié aux fonctionnaires de police (Service de soin de suite et de réadaptation en addictologie du Courbat, Indre-et-Loire, France) (n=133). Chaque patient a complété des questionnaires auto-administrés évaluant l'exposition éventuelle à des évènements traumatiques au cours de la vie (LEC-5), le TSPT avec sa sévérité et son diagnostic (PCL-5), la sévérité du TUA (AUDIT), la dépendance tabagique (FTND), la dépendance au cannabis (CAST), le jeu d'argent pathologique (CPGI), l'addiction à l'alimentation (mYFAS).

Résultats : Notre échantillon comprenait une prévalence élevée du TSPT (38.3%) ainsi que pour les troubles addictifs : dépendance tabagique (68.4%), addiction à l'alimentation (7.5%), addiction au cannabis (3.8%) et le jeu d'argent pathologique (3%). Les patients avec un TSPT expérimentaient plus expériences traumatiques : agressions physiques, souffrance humaine, la mort soudaine de tierce personne, et d'autres types d'expériences/évènements stressants. Les régressions multiples linéaires ajustées avec l'âge, le sexe et le statut marital, le TSPT était un facteur prédicteur de la sévérité du trouble de l'usage d'alcool, de l'usage de tabac et de l'addiction à l'alimentation, mais pas de l'addiction au cannabis, ni du jeu d'argent pathologique.

Conclusion : Le trouble de stress posttraumatique est fréquent chez les fonctionnaires de police hospitalisés pour un trouble de l'usage d'alcool et est associé avec une forte sévérité à plusieurs types d'addiction (alcool, tabac et alimentation). Le trouble de stress posttraumatique et ses troubles comorbides doivent être systématiquement dépistés et traités dans cette population.

Mots-clés : Troubles liés aux substances et aux addictions ; Trouble de l'usage d'alcool ; Trouble de stress posttraumatique ; Trouble de l'usage en tabac ; Jeu d'argent pathologique ; Addiction à l'alimentation ; Addictions comportementales ; trouble de l'usage en cannabis ; Service de soin de suite et de réhabilitation en addictologie.

ABSTRACT

Introduction: In police officers, posttraumatic stress disorder (PTSD) is associated with alcohol use disorder (AUD), but we lack data on the association between PTSD and other substance-related and addictive disorders. We aimed at determining whether PTSD could be a risk factor for different substance-related and addictive disorders in police officers, including alcohol, tobacco, cannabis, gambling and food.

Methods: This cross-sectional study included all police officers admitted consecutively for an AUD in an inpatient ward dedicated to police officers (Le Courbat rehabilitation center, France) (n=133). Each patient completed self-administered questionnaires that assessed lifetime exposure to potentially traumatic events (LEC-5), PTSD severity and diagnosis (PCL-5), AUD severity (AUDIT), tobacco dependence (FTND), cannabis dependence (CAST), gambling disorder (CPGI), and food addiction (mYFAS).

Results: Our sample comprised a high prevalence for PTSD (38.3%) and for substance-related and addictive disorders: tobacco dependence (68.4%), food addiction (7.5%), cannabis dependence (3.8%) and pathological gambling (3%). Patients with PTSD experienced higher lifetime exposure to traumatic experiences: physical assault, severe human suffering, sudden accidental death of another people, and other types of stressful event/experiences. In multiple linear regressions adjusted for age, sex and marital status, PTSD was a significant predictor of the severity of alcohol use disorder, tobacco use disorder and food addiction, but not cannabis use disorder nor gambling disorder.

Conclusion: PTSD is common in police officers hospitalized for an AUD and associated with higher severity of some addictive disorders (alcohol, tobacco and food). PTSD and its comorbid addictive disorders should be systematically screened and treated in this population.

INTRODUCTION

Posttraumatic stress disorder (PTSD) is a major public health problem (Kessler, 2000) with a prevalence of 8% (Gielen, Havermans, Tekelenburg, & Jansen, 2012; Kessler et al., 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). PTSD is highly comorbid with other psychiatric disorders, and especially with substance use disorders such as alcohol use disorder (AUD) or tobacco use disorder (Hingray, Donné, et al., 2018; McCauley, Killeen, Gros, Brady, & Back, 2012; Ouimette, Read, Wade, & Tirone, 2010). Individuals with substance use disorder (SUD) have a higher lifetime PTSD prevalence between 30 to 59% (Gielen et al., 2012; Stewart, Pihl, Conrod, & Dongier, 1998). Moreover, 80% of people with AUD were exposed to at least one or more traumatic event in their life, which is much higher than the 50% rate observed in the general population (Dragan & Lis-Turlejska, 2007b). In addition to alcohol use disorder (AUD) (Petrakis & Simpson, 2017) and tobacco use disorder (TUD) (Kelly, Jensen, & Sofuoglu, 2015), PTSD is associated with many other substance-related and addictive disorders such as pathological gambling (Ledgerwood & Petry, 2006) and food addiction (Mason et al., 2014). Several mechanisms have been proposed to explain the association between PTSD and addictive disorders (Chilcoat & Breslau, 1998). For instance, substance users/patients with behavioral addictions may be more exposed to traumas because of their risky behavior, thus increasing PTSD risk, but substance abusers/patients with behavioral addictions may also use drugs as self-medication to attenuate posttraumatic symptoms (Chilcoat & Breslau, 1998; Vujanovic et al., 2011). In all cases, PTSD and SUD (especially AUD) are highly comorbid, and such a dual diagnosis implies some specific features: PTSD can be worsened after substance withdrawal while it is possible to treat or even cure it unlike other psychiatric disorders (e.g., schizophrenia or bipolar disorder) (Najavits, 2005).

One of the most at-risk population for exposure to traumatic events is the population of police officers, which may be exposed daily to traumatic, violent or horrific events, thus leading to an elevated risk of PTSD (Carlier et al., 1997; Davidson & Moss, 2008; Marmar et al., 2006). Prior studies showed a high prevalence of PTSD among police officers of 15 to 50% (Carlier et al., 1997; Davidson & Moss, 2008; Marmar et al., 2006), higher PTSD severity (Hartley, Violanti, Sarkisian, Andrew, & Burchfiel, 2013), and higher comorbidity with AUD (Ballenger et al., 2011; Leino, Eskelinen, Summala, & Virtanen, 2011; Ménard & Arter, 2013; Swatt, Gibson, & Piquero, 2007).

Worldwide, European and French police forces face increasing violence, especially related to terrorist attacks (Philippe et al., 2016). The last few years have been marked by terrible attacks around the world, and French police officers have been particularly exposed to such violence, with the recent attacks of Charlie Hebdo (January 2015), Paris (November 2015) and Nice (July 2016).

In France, one specific rehabilitation center has been built to treat police officers suffering from AUD, namely Le Courbat rehabilitation center, which is a private not-for-profit institution located in Centre Val de Loire Region, France. This rehabilitation center, which is managed by the ANAS (Association Nationale d'Action Sociale de la Police nationale des personnels du Ministère de l'Intérieur) association and which is under the responsibility of the Regional Health Agency, Centre-Val-de-Loire (France) with a close collaboration with the Ministry of Interior, has a nation-wide recruitment. This gave us the unique opportunity to assess PTSD prevalence in a population of police officers suffering from AUD and to assess its comorbid factors. Although "Le Courbat" is also open to other patients suffering from AUD (this rehabilitation center admits nearly 300 patients every year), it is the first national rehabilitation center in terms of number of inpatients police officers hospitalized each year for AUD.

Although PTSD is associated with addictive disorders in the overall population, and although police officers are a population with heightened PTSD prevalence (Ménard & Arter, 2013; Swatt et al., 2007), to our knowledge no study has investigated the association between PTSD and such a wide range of substance-related and addictive disorders in this specific population. We may indeed assume that the strength of the association between PTSD and addictive disorders may depend upon the type of substance or behavior considered. Given the specific context of increased violence faced by police officers, we may assume that the prevalence of PTSD and addictive disorders increased over time in this specific population. Such a context stresses the need to study PTSD prevalence and its association with substance-related and addictive disorders in this population.

The main objective of this study was to determine the association between PTSD and a variety of substance-related and addictive disorders (i.e., TUD, cannabis use disorder, gambling disorder and food addiction symptoms) in a population of inpatient police officers hospitalized for AUD. Our secondary objective was to confirm the association between PTSD and AUD severity, and to determine whether some specific traumatic events were associated with PTSD in this specific population.

METHODS

Population

The participants were recruited at the rehabilitation center Le Courbat. We recruited all consecutive patients hospitalized between January 2016 and October 2017 at this rehabilitation center. Patients were considered eligible if they were aged at least 18 years and if they gave informed and signed consent for this study (which was systematically assessed for each patient).

The study consisted on answering a detailed self-questionnaire that was administered one week after admission (see Measures section for more details). Patients completed these evaluations using digital tablets provided for this specific study. The self-administered questionnaires were designed and filled-in online using the Sphinx mobile iQ 2 software.

Our final population was based on patients who had an AUD (AUDIT score ≥ 8) and had fully completed self-administrated questionnaires.

Measures

For each patient, we assessed socio-demographical characteristics (age, sex and marital status). We assessed history of traumatic life events, PTSD, and substance-related and addictive disorders (alcohol, tobacco and cannabis use disorder, gambling disorder, and food addiction) using self-administered questionnaires.

Traumatic events

We assessed history of potentially traumatic events using the Life Event Checklist for DSM-5 (LEC-5) (original version: Weathers et al., 2013; French adaptation by Montreal study center of trauma, 2015). This self-administered questionnaire, which screens for potentially traumatic events in a respondent's lifetime, assesses exposure to events known to potentially result in PTSD or distress with an additional item assessing other extraordinary stressful event not included in the first 16 items. These 17 items belong to any of the following type of

traumatic event: natural disasters, physical aggression, sexual aggression, severe injuries, exposure to violent death, and other traumatic events. The LEC-5 is often used in combination with other measures as PCL-5 for the purpose of establishing exposure to a traumatic event corresponding to DSM-5 criterion A (Weathers et al., 2013).

Posttraumatic Stress Disorder

We assessed PTSD severity using the PCL-5 scale (PTSD Check List for DSM-5) (original version: Blevins, Weathers, Davis, Witte, & Domino, 2015; French validation: Ashbaugh, Houle-Johnson, Herbert, El-Hage, & Brunet, 2016). This 20-item self-administered questionnaire assesses DSM-5 symptoms of PTSD, with a Likert-type scale for each symptom ranging from 0 (not at all) to 4 (extremely"). The PCL-5 allows to diagnose PTSD through DSM-5 criteria and to assess PTSD severity (Blevins et al., 2015). In this study, we used the cutoff of 33 to diagnose PTSD (Weathers et al., 2013): a provisional PTSD diagnosis can be made by treating each item rated as 2 = "Moderately" or higher as a symptom endorsed, then following the DSM-5 diagnostic rule which requires at least: 1 B item (questions 1-5), 1 C item (questions 6-7), 2 D items (questions 8-14), 2 E items (questions 15-20).

Alcohol use disorder

We assessed AUD using the Alcohol Use Disorder Identification Test (AUDIT) (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) validated in French (Gache et al., 2005). The AUDIT was developed in collaboration with the World Health Organization (WHO), it includes 10 questions about level of consumption, symptoms of dependence and alcohol related consequences. Its internal consistency was found to be high and test-retest date have suggested a good reliability (α = .86) and sensibility of .90 (Saunders et al., 1993). We considered the cut-off $\geq$ 8 for an AUD and we used the AUDIT total score to assess AUD severity.

Tobacco use disorder

We assessed tobacco use disorder using the Fagerström test for Nicotine Dependence (FTND), also referred as the Fagerström Test for Cigarette Dependence (original version: Fagerström, 1978; French validation: Etter, Duc, & Perneger, 1999). The FTND is composed of 6 questions assessing nicotine/tobacco dependence and its severity. In this study we considered "low to very high" tobacco dependence if the patient had a FTND score ≥ 3, "very high" dependence if the patient had a FTND score ≥ 8, and we assessed tobacco use disorder severity using the FTND total score.

Cannabis use disorder

We assessed cannabis use disorder using the Cannabis Abuse Screening test (CAST). This six-item self-administered questionnaire was designed at the French Monitoring Center for Drug Addiction and validated in French (Legleye, Kraus, Piontek, Phan, & Jouanne, 2012). It assesses cannabis use and its consequences over the past 12 months. The CAST has a one-factor structure and has a good internal consistency (α = 0.81). Among cannabis users, the CAST shows very high sensitivity and specificity, 93% and 81%, respectively, compared to another screening tool for cannabis abuse (Problem-Oriented Screening Instrument for Teenagers) (Legleye et al., 2012). In this study we considered cannabis dependence if the patient had a CAST score ≥ 3 and we used the CAST total score to assess cannabis use disorder severity.

Gambling disorder

We assessed gambling disorder using the Canadian Problem Gambling Index (CPGI) developed by the Canadian center on alcohol and substance abuse (Ferris & Wynne, 2001). This self-administered questionnaire includes 9 items, with each item scoring from 0 to 3, leading to a total score ranging from 0 to 27. The CPGI is internationally recognized as a robust measure of gambling disorder (Caillon, Grall-Bronnec, Hardouin, Venisse, & Challet-

Bouju, 2015), with a good internal consistency (α = 0.84) (Ferris & Wynne, 2001). In this study, and in line with the recommended thresholds, we considered a given patient being "at risk for gambling disorder" when the CGPI score was $\geq$ 3, and having "problem gambling" when the CPGI score was $\geq$ 8 (Ferris & Wynne, 2001).

Food addiction

We assessed food addiction using the modified version of the Yale Food Addiction Scale (mYFAS) (Flint et al., 2014). The mYFAS is a nine-item questionnaire, which is a short version of the YFAS designed by Gearhardt et al. and composed of 25 items (Gearhardt, Corbin, & Brownell, 2009). The original YFAS assesses food addiction phenotype over the past 12 months, based on the hypothesis that it is possible to apply the DSM-IV-TR substance dependence diagnostic criteria to the consumption of some foods (i.e., food high in fat, sugar and/or salt). The YFAS and the mYFAS aim at assessing 7 diagnostic criteria for "food addiction", as well as significant distress in relation to food. According to their authors, a food addiction is diagnosed when at least three out of the seven diagnostic criteria were observed during the previous 12 months and clinically significant impairment or distress was confirmed. The mYFAS has adequate internal consistency (α = .75), which was identical to the internal consistency for diagnostic criteria for the full version or the YFAS, and seven diagnostic criteria for food addiction, and has convergent validity with emotional eating and binge eating. In this study, we used the mYFAS to diagnose food addiction, and the mYFAS total score (symptom count) to assess food addiction severity.

Statistical analyses and ethics

Analyses were performed using SPSS version 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). All analyses were two-tailed; p-values ≤ 0.05 were considered statistically significant.

Descriptive statistics included percentages for ordinal variables and mean and standard deviation for continuous variables. We determined the variables associated with PTSD status (PTSD diagnosis vs. no PTSD) using univariate analyses: either mean comparison tests (Mann-Whitney U test with the corresponding z-value or Student's test with the corresponding t-value) or chi-squared tests (Pearson chi-squared test or Fisher exact test if expected frequencies were < 5 in at least one cell), depending on the type of the variable studied. We used multivariate analyses (multiple linear regression) to determine whether PTSD diagnosis (dependent variable) was a significant predictor for severity in each addictive disorder (we used one multivariate analysis per addictive disorder to predict the severity of each addictive disorder, namely alcohol use disorder severity, tobacco use disorder severity, cannabis use disorder severity, gambling disorder severity, food addiction symptoms). For each of these multivariate analyses, we determined the association between PTSD status (dependent variable) and the corresponding addiction severity (corresponding AUDIT, Fagerström, CAST, CPGI and mYFAS total score; independent variables) after adjusting for age, sex and marital status (additional dependent variables because usually associated with addictive disorders). For each dependent variable, we specified the beta regression coefficient, its 95% confidence-interval, and the associated *t*-value and *p*-value. A p-value ≤ .05 was considered significant for all analyses (bilateral).

This study obtained the approval of an institutional review board in July 2015, prior to the beginning of the study (CERNI Tours-Poitiers, 2015-08-01). All the data collected were in line with the French recommendation regarding use of personal data, with the approval of the

French CNIL (Commission Nationale de l'Informatique et des Libertés). This study comply with the APA ethical standards.

RESULTS

Participants

Figure 1 presents the study flow chart. A total of 208 police officers were hospitalized at Le Courbat rehabilitation center during the inclusion period. Of these, 189 were initially included (19 did not give signed and informed consent), of whom 56 were excluded (44 had an AUDIT score < 8, and 12 had at least one missing data). Our final population is thus based on 133 patients.

Descriptive statistics

Descriptive statistics of the whole sample (n=133) are presented in Table 1. Patients were predominantly males (93.2%) and their mean age was 43.9 ± 6.5 years. Mean AUDIT score was 23.7 ± 8.0. Prevalence rates for substance/behavior use over the past 12 months were 81.2% for tobacco, 10.5% for cannabis, 4.5% for other illicit drugs, and 48.1% for gambling, respectively. According to the previously defined cutoffs, prevalence rates for substance-related and addictive disorders were 68.4% for "low to very high" tobacco dependence, 3.8% for cannabis dependence, 3% for pathological gambling, and 7.5% for food addiction, respectively.

According to the PCL-5 defined cutoffs, prevalence rate for DSM-5 PTSD was 38.3%. Most patients (99.2%) experienced at least one lifetime traumatic event. The most prevalent categories of traumatic experiences were, by order of prevalence, exposure to illness, injury or death experiences (91%), accidents (82%), physical aggressions (79.7%), natural disasters (67.7%), war-related traumas (15%) and sexual abuse (15%). Any other traumatic experiences (not specified in the previously mentioned categories) were present in 79.7% of our sample.

34

Comparison between patients with versus without PTSD

Socio-demographics and substance-related and addictive disorders

Table 1 presents the comparison of the socio-demographic and addictive disorder characteristics between patients with versus without PTSD. Patients with PTSD did not differ from patients without PTSD in terms of age, sex nor marital status. Patients with PTSD experienced higher AUD severity than patients without PTSD (AUDIT score was 26.4 ± 8.1 vs. 22.1 ± 7.5; p=.002). Patients with PTSD did not differ from patients without PTSD in terms of alcohol, tobacco, cannabis, illicit drug use or gambling over the past 12 months. PTSD was associated with some substance-related and addictive disorders: AUD, "very high" but not "low to very high" tobacco dependence, food addiction diagnosis and severity, but not cannabis use disorder, gambling disorder diagnosis nor gambling disorder severity.

Association between PSTD and type of traumatic events

Table 2 presents the comparison of the prevalence of traumatic events between patients with versus without PTSD. Patients with PTSD experienced significantly higher lifetime exposure to any illness, injury or death experiences (especially severe human suffering and sudden accidental death), higher exposure to physical assault, and higher exposure to any other very stressful event or experience. The prevalence for other traumatic events did not differ between patients with vs. without PTSD.

Predictors of each substance-related and addictive disorders severity

Multiple linear regressions are presented for AUD severity (Table 3), TUD severity and food addiction severity (Table 4), as well as cannabis use disorder severity and gambling disorder severity (Table 5). After adjustment for age, sex and marital status, diagnosis of PTSD was a significant predictor of AUD (AUDIT total score), TUD (FTND total score) and food addiction severity (mYFAS symptom count). PTSD diagnosis was not a significant predictor

of cannabis use disorder severity (CAST total score) nor gambling disorder severity (CPGI total score).

DISCUSSION

The main objective of this study was to examine the association between PTSD and substance-related and addictive disorders in police officers hospitalized for an AUD. We found that PTSD, which was observed in 38.3% of our population, was associated with higher AUD severity and higher prevalence for some addictive disorders ("very high" tobacco dependence and food addiction, but not gambling disorder nor cannabis use disorder). We also found that patients with PTSD did not differ from patients without PTSD in terms of age, sex or marital status, but they experienced significantly higher prevalence for some types of traumas (items "physical assault", "sudden accidental death", "severe human suffering" and "any other very stressful event or experience")

The PTSD prevalence observed in our study is in the upper ranger of those observed in studies that included police officers or veterans with an AUD (10-50% according to Menard et al. 2013; 20% according to Norman, Haller, Hamblen, Southwick, & Pietrzak, 2018), and higher than those observed in general population (10-30% according to Gielen et al, 2012 and Evren et al., 2011). The differences in PTSD prevalence may also be explained by the way PTSD is assessed, either through self-administered questionnaires or semi-structured interviews (Dragan & Lis-Turlejska, 2007b). In our study, we assessed PTSD using a self-administered questionnaire based on DSM-5 criterions.

Results from multiple linear regressions demonstrated that PTSD was a significant predictor for higher AUD severity, "very high" (but not "low to very high") tobacco dependence and tobacco dependence severity, food addiction symptoms, but not cannabis use disorder nor gambling disorder. The association found between PTSD and AUD severity is in line with previous studies (Hingray, Cohn, et al., 2018; Kachadourian, Gandelman, Ralevski,

36

& Petrakis, 2018; McFall, Mackay, & Donovan, 1992; Walton et al., 2018). The association between a more severe AUD and PTSD may be due to the amnestic, anxiolytic and sedative properties of alcohol that may help these patients to cope with the intrusive PTSD symptoms and to avoid them (self-medication hypothesis), and is also supported by the fact that PTSD is more frequently present prior to an addictive disorder rather than the opposite (Hruska, Pacella, George, & Delahanty, 2017). This is supported by prior studies conducted in military veterans that also showed that AUD severity was correlated with increased PTSD severity and more severe psychopathology, including higher prevalence of suicide attempts (Kachadourian et al., 2018; McFall et al., 1992; Walton et al., 2018). In our study, PTSD was also a significant predictor for TUD, but only for "very high" tobacco dependence, and not for "low to very high" dependence. Co-occurrence between PTSD and tobacco dependence has already been demonstrated in civilian and veteran populations (Waldrop & Cohen, 2014; Walsh et al., 2014), but we found here that it was only the case for "very high" and not "low to very high" dependence.

The association found between PTSD and food addiction is also in line with previous studies (Mason et al., 2014; Mitchell & Wolf, 2016). In a large sample of 49000 women, Mason et al found that women with greater number of PTSD symptoms were twice as likely to meet food addiction criteria (Mason et al., 2014). These results were replicated in veterans: Mitchell and Wolf additionally found that the association between PTSD and food addiction could be explained by lower emotional regulation (Mitchell & Wolf, 2016). One original finding of our study is to demonstrate this association in a population of predominantly male police officers. Food addiction is more frequently studied in women, which are at higher risk for this disorder (Pursey, Stanwell, Gearhardt, Collins, & Burrows, 2014). Given that male have generally more difficulty than women at processing and expression emotions (Collignon et al., 2010), the observation of a food addiction prevalence rate close to those observed in the

general population (Pursey et al., 2014) indicates that food addiction symptoms (e.g., food craving) should be systematically assessed in male in this at-risk population. Food addiction is a recent concept that postulates that some patients may experience loss of control over some specific foods high in fat, sugar and/or salt, and maintenance of such a behavior despite harm, similar to SUD (Gearhardt et al., 2009), and further studies are needed to contribute to the debate on whether it should be included in the international diagnostic classifications. To this end, future studies could assess harm associated with food addiction in this population, including weight gain, obesity and/or metabolic syndrome.

Cannabis use disorder prevalence and severity were not associated to PTSD, which is contrary to prior studies conducted in different populations (Bonn-Miller, Vujanovic, Boden, & Gross, 2011; Bremner, Southwick, Darnell, & Charney, 1996; Bujarski et al., 2012; Steenkamp, Blessing, Galatzer-Levy, Hollahan, & Anderson, 2017; Walsh et al., 2014). Vietnam veterans with higher PTSD scores reported greater frequency of cannabis use (Bremner et al., 1996), and cannabis was hypothesized to help coping to PTSD symptoms such as hyperarousal, emotional distress, and intrusive thoughts of the trauma (Bonn-Miller et al., 2011; Bujarski et al., 2012; Steenkamp et al., 2017). Although prevalence for at risk gambling was higher in our sample than in the general population (.3 to .4%) (Bouju, Grall-Bronnec, Landreat-Guillou, & Venisse, 2011), no association was found with PTSD. This result, which is not in line with previous studies (Del Pino-Gutiérrez et al., 2017; Konkolÿ Thege, Hodgins, & Wild, 2016), might be explained by the specificity of our population, or by the lack of statistical power given the low prevalence of this disorder.

In sum, PTSD was associated with addictive disorders to substances/behaviors that are, unlike cannabis, easily available and not illicit. We may assume that the lack of association between cannabis dependence, gambling disorder and PTSD might be explained by the attitudes of police officers towards gambling and cannabis. Unlike cannabis, alcohol,

tobacco and food are widely available and have a legal status in Le Courbat (France), and use of alcohol, tobacco or food may be better socially accepted than gambling and cannabis. One can assume that gambling and cannabis might be considered as less morally acceptable by police officers, because the police officers' job relies on compliance to the law. An alternative explanation may be the underestimation of cannabis and illicit drug users due to the fear of the negative consequences of such a self-report for their job, or alternatively because they may be more sensitized than the overall population to harm associated with cannabis use given their job. These hypotheses may also explain the relative low prevalence of cannabis use and cannabis use disorder for a sample of patients hospitalized for an AUD.

Altogether, these results confirm the need to systematically screen for PTSD in patients hospitalized for an AUD, and to systematically screen for some other SUDs and food addiction in case of PTSD. A "very high" tobacco dependence and a food addiction diagnosis should also be considered as disorders that should lead to a more frequent PTSD screening. As PTSD is associated with a wide range of addictive disorders, one should be aware that patients with PTSD should be systematically monitored not only for their AUD, but also for TUD and food addiction, because they may be at higher risk for addiction transfer or addiction switch if PTSD or comorbid psychiatric disorders remains untreated (Brunault et al., 2015; Steffen, Engel, Wonderlich, Pollert, & Sondag, 2015).

This study has several limitations, the first being its cross-sectional design. The second is that the diagnoses of addictive disorders were all based on self-administered questionnaires rather than semi-structured interviews, and such an assessment increases the risk of false positives, due to possible declaration and memorization biases. On the other hand, assessment of cannabis and illicit drug use may have been underestimated because the police officers may have feared negative consequences for their work from such a self-report. Another limitation

of our study was a selection bias of our population, which was selected because our study was conducted in a rehabilitation center that has a national recruitment and mainly comprises men (93%). This may have selected police officers with higher AUD severity, and probably also with higher prevalence for psychiatric and addictive disorders. Further studies should be conducted with women samples in order to test the generalizability of our findings in this population.

Conclusion

Posttraumatic stress disorder is a psychiatric disorder that is highly prevalent among police officers hospitalized for an AUD. We confirmed that, in this population, PTSD was associated with a more severe AUD, and we also found that PTSD was associated with higher prevalence and severity for two other addictive disorders: tobacco use disorder and food addiction. These results suggest that PTSD should be systematically screened for and treated as appropriate in this population, and that PTSD diagnosis should also systematically lead to screening for "very high" tobacco dependence and food addiction. Future studies should determine whether PTSD treatment could improve the outcomes of AUD and of its other associated addictive disorders for these patients. Given that Eye Movement Desensitization and Reprocessing (EMDR) is an evidence-based treatment effective for PTSD that reduces PTSD symptoms in patients with PTSD (Schäfer et al., 2017a), future studies could test its effectiveness in patients with AUD and comorbid PTSD on both PTSD, alcohol use disorder severity, and other addictive disorders.

TABLES AND FIGURES

Table 1. Descriptive statistics of the complete sample, and comparison of AUD patients with versus without posttraumatic stress disorder (PTSD).

	Complete sample (n = 133)	Patients without PTSD (n=82)	Patients with PTSD (n=51)	Statistics	p
Socio-demographic characteristics					
Age (years)	43.9 ± 6.5	44.5 ± 6.0	43.0 ± 7.2	t=1.35	0.18
Sex (male)	93.2% (124)	95.1% (78)	90.2% (46)	χ²=1.21	0.30
Marital status (married or in a relationship)	45.1% (60)	48.8% (40)	39.2% (20)	χ²= 1.16	0.28
Substance/behavior use (past 12 months)					
Alcohol	100% (133)	100% (82)	100% (51)	-	-
Tobacco	81.2% (108)	78% (64)	86.3% (44)	χ²=1.39	0.24
Cannabis	10.5% (14)	9.8% (8)	11.8% (6)	χ²=0.13	0.71
Any other illicit drug	4.5% (6)	3.7% (3)	5.9% (3)	χ²=0.36	0.55
Gambling	48.1% (64)	51.2% (42)	43.1% (22)	χ²=0.82	0.36
Substance-related and addictive disorders					
Alcohol					
AUDIT total score*	23.7 ± 8.0	22.1 ± 7.6	26.4 ± 8.1	t=4.29	0.002
Tobacco					
"Low to very high" tobacco dependence (FTND≥3)	68.4% (91)	68.3% (56)	68.6% (35)	χ²=0.01	0.97
"very high" tobacco dependence (FTND≥8)*	38.3% (51)	29.3% (24)	52.9% (27)	χ²=7.45	0.006
FTND total score*	4.1 ± 3.1	3.6 ± 2.8	4.90 ± 3.3	t=2.36	0.02
Cannabis					
Cannabis dependence (CAST≥3)	3.8% (5)	2.4% (2)	5.9% (3)	χ²=1.03	0.37
CAST total score	.2 ± 0.8	.2 ± 0.8	.3 ± .9	t=0.66	0.51
Gambling					
At risk gambling (CPGI≥3)	8.3% (11)	7.3% (6)	9.8% (5)	χ²=.026	0.61
Problem gambling (CPGI ≥ 8)	3% (4)	3.7% (3)	2% (1)	χ²=0.31	1.00
CGPI total score	.8 ± 3.1	.80 ± 3.27	.9 ± 3.0	t=0.10	0.92
Food					
Food addiction diagnosis (mYFAS)*	7.5% (10)	2.4% (2)	15.7% (8)	χ²=7.94	0.005
mYFAS total score (symptom count)*	1.2 ± 1.1	0.95 ± 0.86	1.5 ± 1.4	t=2.52	0.014
Posttraumatic stress disorder (PTSD)					
PTSD diagnosis (DSM-5 criteria)	38.3% (51)	-	-	-	-
PTSD severity (PCL-5 score)*	27.1 ± 17.9	16.6 ± 12.9	44.0 ± 10.1	t=12.86	<.001
Cluster B score*	6.4 ± 5.0	3.7 ± 3.7	10.7 ± 3.6	t=10.73	<.001
Cluster C score*	2.8 ± 2.4	1.6 ± 1.9	4.8 ± 1.7	t=9.91	<.001
Cluster D score*	9.9 ± 7.0	6.3 ± 5.7	15.7 ± 4.7	t=9.88	<.001
Cluster E score*	8.1 ± 5.8	5.1 ± 4.7	12.8 ± 3.8	t=9.99	<.001

Legend: Descriptive data are presented as mean ± standard deviation or percentage (number). We compared patients with and without PTSD using mean comparison tests (Mann Whitney U test with the corresponding z-value or Student's test with the corresponding t-value) and chi-squared tests. * indicates the factors significantly associated to PTSD status. AUD: Alcohol Use Disorder; AUDIT: Alcohol Use Disorder Inventory Test; CAST: Cannabis Abuse Screening Test; CPGI: Canadian Pathological Gambling Inventory; FTND: Fagerström Test for Nicotine Dependence; mYFAS: modified Yale Food Addiction Scale; CTQ: Childhood Trauma Scale; CAST: Clinician Admitted PTSD Scale. PCL-5 (PTSD Checklist for DSM-5). PTSD: Post Traumatic Stress Disorder

Table 2. Descriptive statistics of the traumatic events experienced in the complete sample (LEC-5), and comparison between patients with versus without posttraumatic stress disorder (PTSD).

Participant has experienced at least one…	Complete sample (n = 133)	Patients without PTSD (n=82)	Patients with PTSD (n=51)	Statistics	p
Traumatic event	99.2% (132)	99% (81)	100% (51)	χ²=0.63	1
Natural disaster	67.7% (90)	69.5% (57)	64.7% (33)	χ²=0.33	0.56
Natural disaster	33.8% (45)	35.3% (29)	31.4% (16)	χ²= 0.22	0.64
Fire or explosion	60.2% (80)	61.0% (50)	58.8% (30)	χ²=0.06	0.81
Accident	82% (109)	80.5% (66)	84.3% (43)	χ²=0.31	0.58
Transportation accident	78.2% (104)	78.0% (64)	78.4% (40)	χ²=0.03	0.96
Serious accident at work or during recreational activity	50.4% (67)	47.6% (39)	54.9% (28)	χ²=0.68	0.41
Exposure to toxic substance	18.8% (25)	22.0% (18)	13.7% (7)	χ²=1.40	0.24
Physical aggression	79.7% (106)	76.8% (63)	84.3% (43)	χ²=1.09	0.30
Physical assault*	74.4% (99)	68.3% (56)	84.3% (43)	χ²=4.24	0.04
Assault with a weapon	60.2% (80)	56.1% (46)	66.7% (34)	χ²=1.47	0.23
Sexual aggression	15% (20)	12.2% (10)	19.6% (10)	χ²=1.35	0.25
Sexual assault	12.0% (16)	9.8% (8)	15.7% (8)	χ²=1.05	0.31
Other unwanted or uncomfortable sexual experience	12.0% (16)	9.8% (8)	15.7% (8)	χ²=1.05	0.31
War-related trauma	15% (20)	15.9% (13)	13.7% (7)	χ²=0.11	0.74
Combat or exposure to a war-zone	13.5% (18)	14.6% (12)	11.8% (6)	χ²=0.22	0.64
Captivity	3.0% (4)	2.4% (2)	3.9% (2)	χ²=0.24	0.63
Exposure to illness, injury or death experiences*	91% (121)	85.4% (70)	100% (51)	χ²=8.20	0.004
Life-threatening illness or injury	33.1% (44)	31.7% (26)	35.3% (18)	χ²=0.18	0.67
Severe human suffering*	51.1% (68)	43.9% (36)	62.7% (32)	χ²=4.47	0.04
Sudden violent death	65.4% (87)	64.6% (53)	66.7% (34)	χ²=0.06	0.81
Sudden accidental death*	66.2% (88)	58.5% (48)	78.4% (40)	χ²=5.56	0.02
Serious injury, harm or death you caused to someone else	36.1% (48)	36.6% (30)	35.3% (18)	χ²=0.02	0.88
Any other very stressful event or experience*	79.7% (106)	73.2% (60)	90.2% (46)	χ²=5.63	0.02

Legend: Descriptive data are presented as mean ± standard deviation or percentage (number). We compared patients with and without PTSD using mean comparison tests (Mann Whitney U test with the corresponding z-value or Student's test with the corresponding t-value) and chi-squared tests. * indicates the factors significantly associated to PTSD status. LEC-5: Life Event Checklist based on DSM-5; PTSD: Post Traumatic Stress Disorder

Table 3. Predictors of alcohol use disorder severity in multiple linear regression.

	Alcohol use disorder severity (AUDIT total score)			
	Total effect			
	$B \pm SE$	[95% CI]	t	p
Age	-0.03 ± 0.11	[-0.24; 0.18]	-0.27	0.79
Sex				
Female				
Male	0.47 ± 2.75	[-4.97; 5.91]	0.17	0.87
Marital status				
Single (reference)				
Married or in a relationship	1.53 ± 1.38	[-1.17; 4.30]	1.13	0.26
Posttraumatic stress disorder				
No PTSD (reference)				
PTSD*	4.12 ± 1.41	[1.32; 6.93]	2.91	0.004

Legends: We used a multiple linear regression to predict alcohol use disorder severity (AUDIT total score) based on age, sex, marital status and posttraumatic stress disorder diagnosis ($F_{(4,128)}$=2.70, p=.034; R^2=.078). Results are presented as unstandardized beta (B), its standard error (SE), its 95% confidence interval (95% CI), and its associated t- and p-values. * indicates the factors significantly associated to AUD severity. AUDIT: Alcohol Use Disorder Inventory Test; PTSD: Posttraumatic Stress Disorder.

Table 4. Predictors of tobacco use disorder severity and food addiction severity in multiple linear regressions.

	Tobacco use disorder severity (FTND total score)				Food addiction score (YFAS total score)			
	Total effect				Total effect			
	$B \pm SE$	[95% CI]	t	p-value	$B \pm SE$	[95% CI]	t	p
Age	.01 ± .04	[-.08; 0.09]	0.085	0.93	-0.01 ± 0.02	[-.04; 0.02]	-0.08	0.43
Sex								
Female (reference)								
Male	-0.85 ± 1.07	[-2.96; 1.27]	-0.78	0.43	0.33 ± 0.4	[-.45; 0.3]	0.84	0.40
Marital status								
Single (reference)								
Married or in a relationship	-0.65 ± 0.54	[-1.71; 0.41]	-1.21	0.23	-0.09 ± 0.2	[-0.48; 0.3]	-0.47	0.64
Posttraumatic stress disorder								
No PTSD (reference)								
PTSD	1.23 ± 0.55	[0.14; 2.32]	2.23	0.03	0.55 ± 0.2	[0.15; 0.95]	2.7	0.008

Legends: We used a multiple linear regression to predict tobacco use disorder severity ($F_{(4,128)}$=2.08; R^2=.061; p=.09) and food addiction severity ($F_{(4,128)}$=2.29; R^2=.067; p=.06) based on age, sex, marital status and posttraumatic stress disorder diagnosis. Results are presented as unstandardized beta (B), its standard error (SE), its 95% confidence interval (95% CI), and its associated t- and p-values. ADHD: Attention-Deficit/Hyperactivity Disorder; AUDIT: Alcohol Use Disorder Inventory Test; FTND: Fagerström Test for Nicotine Dependence; PTSD: Posttraumatic Stress Disorder; YFAS: Yale Food Addiction Scale.

Table 5. Predictors of cannabis use disorder severity and gambling disorder severity in multiple linear regressions.

	Cannabis use disorder severity (CAST total score)					Gambling disorder severity (CGPI total score)			
	Total effect					Total effect			
	$B \pm SE$	[95% CI]	t	p		$B \pm SE$	[95% CI]	t	p
Age	0.006 ± 0.01	[-.02; 0.30]	0.56	0.58		-0.04 ± 0.04	[-0.12; 0.0,5]	-0.82	0.41
Sex									
Female (reference)									
Male	0.23 ± 0.29	[-.34; 0.80]	0.07	0.08		1.18 ± 1.11	[-1.02; 3,38]	1.06	0.29
Marital status									
Single (reference)									
Married or in a relationship	-0.06 ± 0.15	[-0.34; 0.23]	-0.03	0.71		-0.83 ± 0.56	[-1,93; 0.27]	-1.5	0.14
Posttraumatic stress disorder									
No PTSD (reference)									
PTSD	0.11 ± 0.15	[-0.18; 0.41]	0.75	0.47		-0.02 ± 0.57	[-1.15; 1.11]	-0.03	0.97

Legends: We used a multiple linear regression to predict cannabis use disorder severity (F(4,128)=.38; R²=.012; p=.82) and gambling disorder severity (F(4,128)=.875; R²=.027; p=.48) based on age, sex, marital status and posttraumatic stress disorder diagnosis. Results are presented as unstandardized beta (B), its standard error (SE), its 95% confidence interval (95% CI), and its associated t- and p-values.
AUDIT: Alcohol Use Disorder Inventory Test; CAST: Cannabis Abuse Screening Test; CGPI: Canadian pathological Gambling Inventory; PTSD: Posttraumatic Stress Disorder.

Figure 1. Study flow-chart.
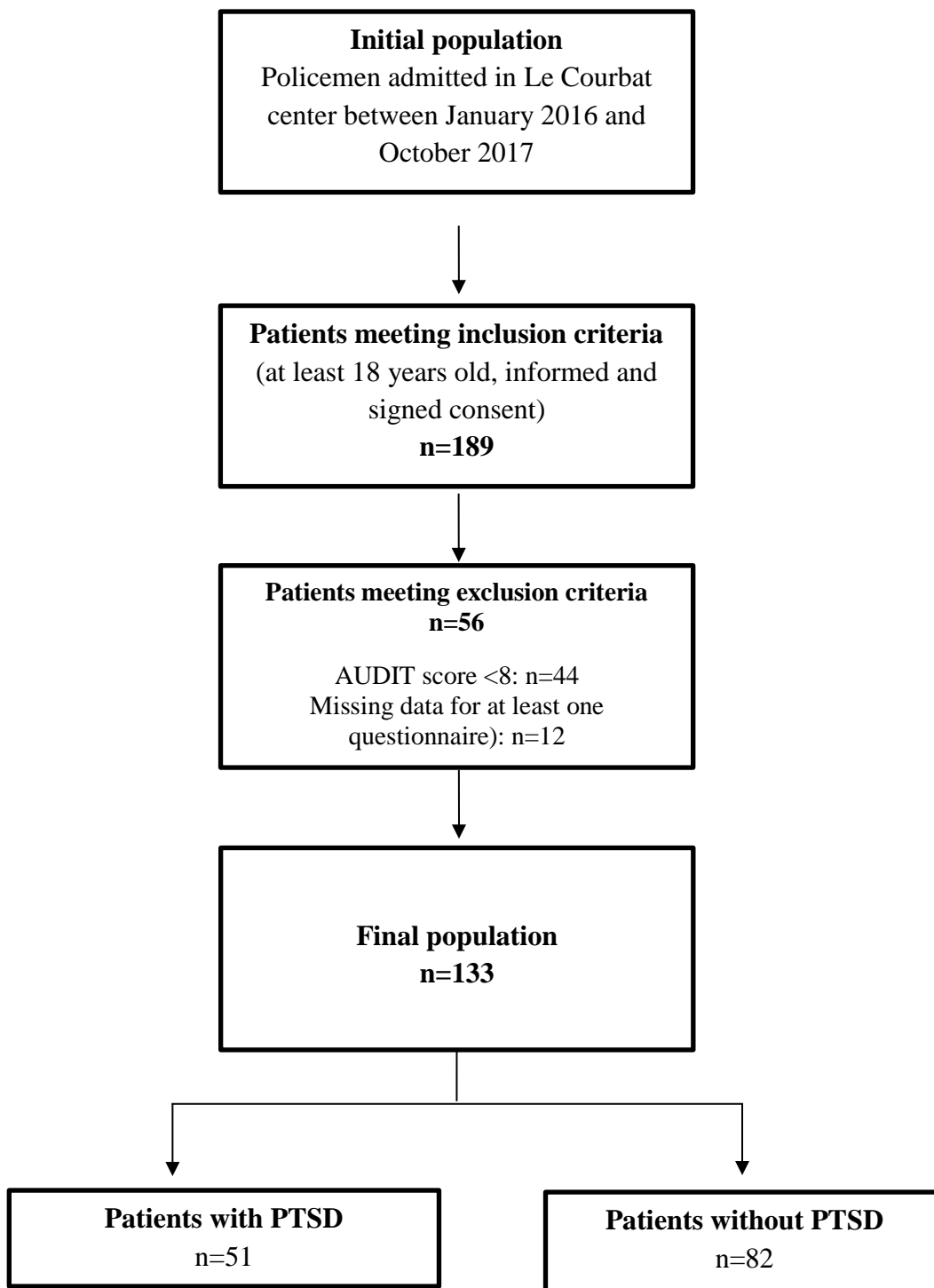
Legends: AUDIT: Alcohol Use Disorder Identification Test; PTSD: Posttraumatic stress disorder.

DEUXIEME ARTICLE (en anglais): Childhood traumas, but not PTSD nor alcohol use disorder severity, predict less PTSD remission in patients hospitalized for an alcohol use disorder and a comorbid PTSD

Titre en Français : Les traumatismes infantiles, mais pas la sévérité du TSPT ni la sévérité du trouble de l'usage d'alcool, prédisent une moins bonne rémission du TSPT chez les patients hospitalisés pour un trouble de l'usage d'alcool avec un TSPT comorbide.

Authors: Paul Brunault[1,2,3,4], Kévin Lebigre[1,2], Fatima Idbrik[5], Damien Maugé[1,6], Philippe Adam[5], Hussein El Ayoubi[1,6,10], Coraline Hingray[6], Servane Barrault[4,6], Grégoire Baudin[4], Marie Grall-Bronnec[8,9], Nicolas Ballon[1,2,4], Wissam El-Hage[2,3]

Institutional affiliations:

1 CHRU de Tours, Équipe de Liaison et de Soins en Addictologie, Tours, France

2 CHRU de Tours, Clinique Psychiatrique Universitaire, Tours, France

3 UMR 1253, iBrain, Université de Tours, INSERM, Tours, France

4 Université de Tours, Département de Psychologie, EA 2114 « Psychologie des Âges de la Vie et adaptation », Tours, France.

5 Soins de Suite et de Réadaptation en Addictologie "Le Courbat", Le Liège, France

6 CHRU de Tours, CSAPA-37, Tours, France

7 Pôle Universitaire du Grand Nancy, Centre Psychothérapique de Nancy, Laxou, France

8 CHU Nantes, Addictology and Psychiatry Department, Nantes, France

9 Université de Nantes, INSERM U1246, Nantes, France

10 Centre Hospitalier Louis Sevestre, La Membrolle-sur-Choisille, France

ABSTRACT

Introduction: Childhood trauma are often associated with posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD). Addictive disorder as AUD can be treated in rehabilitation center, however few studies focused on PTSD evolution during hospitalization. Our aim was to assess, in a population of patients admitted for an AUD and a comorbid PTSD, how many remitted from their PTSD at the end of their hospitalization, and what were the early factors associated with PTSD remission. We further assessed whether PSD remission was associated with evolution in AUD severity.

Methods: This longitudinal study included 91 inpatients admitted in Le Courbat rehabilitation Center, France, for an AUD and with a comorbid PTSD during a height weeks hospitalization. Each patient completed self-administered questionnaires at the first week after the admission (T1) and at the end of their hospitalization (height weeks later= T2) assessed PTSD severity (PCL-5), lifetime exposure to potentially trauma event (LEC-5), exposure to potentially childhood trauma (CTQ), and AUD severity (AUDIT). We used univariate and multivariate analyses to determine what were the early predictors for PTSD remission, and whether PTSD evolution was associated with evolution in AUD.

Results: 74.1% of the whole sample remitted from their PTSD at T2. In multiple linear regression adjusted for age, existence of childhood trauma (physical abuse, emotional abuse, sexual abuse and physical negligence) was predictor of PTSD remission, but not type of trauma, initial PTSD severity nor initial AUD severity. PTSD remission, but not PTSD persistence, was associated with a significant improvement in AUD severity.

Conclusion: Among patients suffering from alcohol use disorder and a comorbid posttraumatic stress disorder, its fundamental to screen for and to treat childhood trauma.

48

Childhood trauma should be screened for and treat as appropriate in this population to deliver tailor-made interventions.

Keywords: Substance-related and addictive disorders; Alcohol use disorder; Posttraumatic stress disorder; Childhood trauma; Predicting factors; Rehabilitation center

RESUME

Introduction : Les traumatismes infantiles sont souvent associés au trouble de stress posttraumatique (TSPT). Les troubles addictifs comme le trouble de l'usage d'alcool (TUA) peuvent être traités dans des centres de soins de suite de de réadaptation en addictologie (SSR-A), cependant peu d'études se sont intéressées sur l'évolution du TSPT durant l'hospitalisation. Notre objectif était d'évaluer dans une population hospitalisée pour un TUA avec un TSPT comorbide, combien étaient en rémission de leur TSPT à la fin de leur hospitalisation et quels étaient les facteurs précoces associés à la rémission du TPST. Nous avons évalué de plus si la rémission du TSPT était associée à l'évolution de la sévérité du TUA.

Méthodes : Cette étude longitudinale inclut 91 patients au SSR-A du Courbat pour un TUA et souffrant également d'un TSPT comorbide pendant une période d'hospitalisation de huit semaines. Chaque patient a complété des questionnaires auto-administrés lors de la première semaine suivant l'admission (T1) et à la fin de l'hospitalisation (huit semaines plus tard=T2) qui ont évalués la sévérité du TSPT (PCL-5), l'exposition à des traumatismes potentiels durant la vie entière (LEC-5), l'exposition à de potentiels traumatismes infantiles (CTQ) et la sévérité du TUA (AUDIT). Nous avons employé des analyses univariées et multivariées pour déterminer quels étaient les prédicteurs précoces de la rémission du TSPT mais également si l'évolution du TSPT était associée à l'évolution du TUA.

Résultats : 74.1% de l'échantillon total était en rémission du TSPT à T2. La régression linéaire multiple ajustée avec l'âge montre que l'existence de traumatismes infantiles (abus physiques, abus émotionnels, abus sexuels et négligences physiques) étaient prédicteurs de l'évolution du TSPT mais pas le type de traumatisme, ni la sévérité initiale du TSPT, ni la

sévérité initiale du TUA. La rémission du TSPT et non sa persistance était associée à une amélioration significative de la gravité du TUA.

Conclusion : Au sein des patients souffrant d'un trouble de l'usage d'alcool et d'un trouble de stress post-traumatique comorbide, il est fondamental de dépister et traiter les traumatismes infantiles afin de leur délivrer une prise en charge sur mesure.

Mots-clés : Troubles liés aux substances et aux addictions ; trouble de l'usage d'alcool ; Trouble de stress post-traumatique ; Traumatismes infantiles ; Facteurs prédicteurs ; Centre de soins de suite et de réadaptation.

INTRODUCTION

Alcohol use disorders (AUD) are defined by a cluster of cognitive, behavioural, and physiological symptoms that indicates persistence use of a substance despite significant substance-related problems (American Psychiatric Association, 2013). These disorders are a major public health problem worldwide, with a lifetime prevalence rate in the United States estimated at 17.8% and 12.5% for 12-months prevalence for alcohol abuse and dependence (Hasin, Stinson, Ogburn, & Grant, 2007), thereby representing a health, social and economic burden for western societies (Kessler, 2000; Wittchen et al., 2011). AUD are often associated with other addictive and psychiatric disorders, and co-occurrence of mental disorders and substance use disorder (dual diagnosis) is a challenge for clinicians given their poorer outcome (Kessler et al., 2005). Posttraumatic stress disorder (PTSD) is one of the most prevalent psychiatric disorders associated with alcohol use disorder and is indeed associated with a poorer outcome (McCarthy & Petrakis, 2010; Taylor, Petrakis, & Ralevski, 2017). In patients with AUD, PTSD prevalence ranges from 30 to 59% (Gielen et al., 2012; Stewart et al., 1998), and it was demonstrated that they experienced less AUD and PTSD remission than patients with AUD without PTSD (Morina, Wicherts, Lobbrecht, & Priebe, 2014; Rosellini et al., 2018; Steinert, Hofmann, Leichsenring, & Kruse, 2015).

To design tailor-made interventions for these patients, it seems crucial to determine which factors are associated with a more severe AUD. Current literature on PTSD and AUD found that different types of variables were associated with AUD severity in this population, namely type of severity trauma, factors related to addiction severity, or sociodemographic characteristics (Hingray, Cohn, et al., 2018; McFall et al., 1992; Walton et al., 2018). In this way, it is well demonstrated that number of lifetime traumatisms is associated with alcohol use disorder severity (Schwandt, Heilig, Hommer, George, & Ramchandani, 2013), and that some types of trauma could be associated with higher prevalence for AUD or a more severe

AUD. More specifically, physical abuse et sexual were specifically associated with AUD severity (Hingray, Donné, et al., 2018; Huang et al., 2012; Nayak, Lown, Bond, & Greenfield, 2012). In women with alcohol-dependence, Hingray and colleague's (2017) found higher prevalence for childhood trauma, with 61% reporting sexual abuse (isolated or repeated) while 32% experienced at least one episode of PTSD (Hingray, Donné, et al., 2018). Childhood trauma are also well studied and it demonstrated that existence of early trauma leads to an early alcohol consumption and thus AUD (Bailey & McCloskey, 2005; Moran, Vuchinich, & Hall, 2004; Tonmyr, Thornton, Draca, & Wekerle, 2010).

To delve further into the factors associated with PTSD outcome in an AUD population, one of the most challenging questions is to determine, in patients with such a dual diagnosis which factors are associated with poorer AUD and PTSD outcome using a longitudinal approach. As factors found to be associated with AUD severity in cross-sectional studies may not be necessary associated with poorer AUD or PTSD outcome, longitudinal studies are needed. In the overall population, several predictors of PTSD remission are known (Morina et al., 2014). Some retrospective studies identified different types of PTSD predictors: trauma-type characteristics, PTSD severity or comorbid psychiatric disorders (Chapman et al., 2012; Rosellini et al., 2018) as well as socio-demographic factors and the existence of childhood trauma (Steinert et al., 2015). In patients with AUD, it was demonstrated that PTSD evolution was dependent upon several factors, including alcohol use severity, sociodemographic factors, stressful life event, coping-strategy, social support, mental health or substance treatment and health care utilization (Possemato et al., 2017). However, no studies investigated whether PTSD remission would be associated with AUD outcome.

One of therapeutic options for patients with AUD is a hospitalization in a rehabilitation center. Although a substantial proportion of patients with AUD and psychiatric

comorbidities are hospitalized in addiction rehabilitation centers, there is, to our knowledge, no data about the variables associated with PTSD and AUD outcome in such populations.

The main objective was to determine, in a population of patients admitted for alcohol use disorder with a comorbid PTSD in an addiction rehabilitation center, how many remitted from their PTSD at the end of their two months hospitalization, and what were the baseline characteristics associated with such PTSD remission. We hypothesized that PTSD remission would be associated with a history of childhood trauma, but not with the type of trauma, alcohol use disorder severity, nor age gender or marital status. According with these previous data, we hypothesized that evolution of PTSD in rehabilitation center depend of alcohol use disorder severity and is also correlated with a severe self-reported trauma profile.

Our secondary objective was to determine the association between PTSD remission at the end of their two-months hospitalization and evolution with alcohol use disorder severity. We hypothesized that patients with a remitted PTSD would present, when compared to patients with non-remitted PTSD, a significant improvement in alcohol use disorder severity during their hospitalization.

METHODS

Population and procedure

The participants were recruited at the rehabilitation center Le Courbat, Centre Val de Loire Region, France. This unique center was built to treat police officers suffering from AUD which managed by the ANAS (Association Nationale d'Action Sociale de la Police Nationale et des personnels du ministère de l'Intérieur) association with a close collaboration with the French Ministry of the Interior. Although "Le Courbat" is also opened to other patients suffering from AUD (this rehabilitation center admits every year nearly 300 patients), this center is the first French rehabilitation center in terms of number of inpatients police officers hospitalized each year for an AUD. We recruited all consecutive patients that were hospitalized between January 2016 and February 2017 at this rehabilitation center. Patients were considered eligible if they were aged at least 18 and if they gave informed and signed consent for this study (which was systematically assessed for each patient).

The study consisted on answering and comparing a detailed self-questionnaire that was delivered one week after admission and one week before exit (see Measures section for more details). Patients completed these evaluations using digital tablets or computers made available for this specific study. The self-administered questionnaires were designed and filled-in online using the Sphinx mobile iQ 2 software.

Our final population was based on patients who had an AUD (AUDIT score ≥ 8) and a comorbid PTSD which have fully completed self-administrated questionnaires. Participants were excluded in case of missing questionnaire assessing PTSD, substance-related and addictive disorders.

Measures

For each patient, we assessed socio-demographical characteristics (age, sex and marital status). We assessed history of childhood trauma, PTSD, and alcohol use disorder using self-administered questionnaires.

Childhood trauma

We assessed at T1 history of potentially childhood trauma experiences using the Childhood trauma Questionnaire (CTQ) (Bernstein et al 1994; French validation by(Paquette, Laporte, Bigras, & Zoccolillo, 2004). It was developed as a screening tool for history of abuse and neglect. The self-report included a 28-item test that measures 5 types of maltreatment – emotional, physical, and sexual abuse, and emotional and physical neglect. A 5-point Likert scale is used for the responses which range from Never True to Very Often True. Reliability for the CTQ is good with high internal consistency scores. Sexual Abuse, Emotional Neglect, Emotional Abuse, Physical Abuse have reported coefficients of .93-.95, .88-92, .84-.89, and .81-.86, respectively (Bernstein et al., 1994). Over a 3 ½ month period, the test-retest coefficient was calculated at close to 0.80. Factor analysis tests on the five-factor CTQ model showed structural invariance which demonstrates good validity (Bernstein et al., 1994).

Posttraumatic Stress Disorder

We assessed PTSD severity at T1 and T2 with the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) (Ashbaugh et al., 2016; Blevins et al., 2015). This 20-item self-administered questionnaire assesses the DSM-5 symptoms of PTSD, with a Likert-type scale for each symptom ranging from 0 (not at all) to 4 (extremely"). The PCL-5 differentiates between PTSD and no PTSD, and also enables the assessment of PTSD severity (Blevins et al., 2015)).

In this study, every patient includes at T1 had a PTSD defined by the DSM-V diagnostic (APA, 2013). We defined a PTSD remission when PCL-5 score at T2 decreased > 30% from the T1 score (Ashbaugh et al., 2016).

Alcohol use disorder

We assessed AUD at T1 and T2 using the Alcohol Use Disorder Identification Test (AUDIT) (Saunders et al., 1993) validated in French (Gache et al., 2005). The AUDIT was developed in collaboration with the World Health Organization (WHO), it includes 10 questions about level of consumption, symptoms of dependence and alcohol related consequences. Its internal consistency was found to be high and test-retest date have suggested a good reliability (α = .86) and sensibility of .90 (Saunders et al., 1993). We considered the cut-off $\geq$ 8 for an AUD and we used the AUDIT total score to assess AUD severity.

Statistical analyses and ethics

Analyses were conducted using SPSS® version 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). All analyses were two-tailed; p-values ≤ .05 were considered statistically significant.

Descriptive statistics included percentages for ordinal variables and mean and standard deviation for continuous variables. We determined the variables associated with PTSD status (remitted PTSD vs no-remitted PTSD) using univariate analyses: either mean comparison tests (Mann-Whitney U test, when the distribution doesn't follow the normal law, with the corresponding z-value or Student's test with the corresponding t-value) or chi-squared tests (Pearson chi-squared test or Fisher exact test if expected frequencies were < 5 in at least one cell), depending on the type of the variable studied. We used multivariate analyses (logistic regressions) to determine whether PTSD characteristics (PCL-5 clusters), lifetime trauma (i.e., accident) and childhood trauma (i.e., physical abuse) were significant predictors for remitted PTSD after adjusting for age, sex and marital status. For each dependent variable, we specified the beta regression coefficient, its 95% confidence-interval, and the associated *t*-value and *p*-value.

This study obtained the approval of an institutional review board in July 2015, prior to the beginning of the study (CERNI Tours-Poitiers). All collected data were in line with the French recommendation regarding use of personal data, with the approval of the French CNIL (Commission Nationale de l'Informatique et des Libertés).

RESULTS

Participants

Figure 1 presents the study flow chart. A total of 381 impatient were hospitalized at Le Courbat rehabilitation center during the inclusion period. Of these, 106 were initially included (275 did not give signed and informed consent or AUDIT<8), out of whom 15 were excluded (had at least one missing data). Our final population is thus based on 91 patients.

Descriptive statistics

Descriptive statistics for socio-demographic, substance use disorder, PTSD characteristics, Lifetime trauma and childhood trauma are presented in Table 1. A total of 91 inpatients completed the two phases of the study. At T1, most of participants were male (82.4%) and mean age was 42.8 ± 8.6 years. Mean AUDIT score was 27.8 ± 7.7 at T1.

Descriptive statistics for PTSD and traumas are presented in table 1. PTSD remission was observed for 74.7% of the inpatients.

The most prevalent categories of childhood traumatic experiences were, by order of prevalence, emotional abuse (33%), emotional negligence (29.7%), physical abuse (20.9%), physical negligence (13.2%), and sexual abuse (12.1%). Concerning lifetime traumatic experience, the most prevalent categories were, by order of prevalence, accidents and physical assault (82.4%), unspecified kind of trauma (75.8%), catastrophe (46.2%), death (30.8%), sexual assault (23.1%) and war (6.6%).

Comparison between remitted-PTSD and non-remitted PTSD

Socio-demographic variables

Table 2 presents baseline characteristics at T1 associated with PTSD remission at T2 in multiple logistic regressions after adjustment for age. Patients with non-remitted PTSD did not differ from patients with a remitted PTSD in term of sex and marital status.

Predictors of remitted PTSD

Logistic regressions presented predictors of the remission of PTSD (Table 2). After adjustment for age, the only variables that were predictive for PTSD remission at T2 were physical abuse, emotional abuse, sexual abuse and physical negligence, but not alcohol use disorder severity, nor the type of lifetime trauma (i.e., catastrophe, accident, physical assault, sexual assault, death war, or any other kind of trauma).

Alcohol use disorder severity

Table 3 presents comparison of the evolution in alcohol use disorder severity between T1 and T2 in the whole sample and in patients with remitted and non-remitted PTSD. patients with remitted PTSD presents a lower score of alcohol use disorder severity (AUDIT score) than non-remitted PTSD impatient.

DISCUSSION

The main objective of this study was to determine, in a population of patients admitted in an addiction rehabilitation center for alcohol use disorder with a comorbid PTSD, how many remitted from their PTSD at the end of their 3-months hospitalization, what were the baseline variables associated with such PTSD remission, and whether PTSD remission would be associated with AUD outcome. We found that 74,7% of our population of patients with AUD a comorbid PTSD remitted from their PTSD 2 months after their hospitalization. PTSD remission was not associated with alcohol use disorder severity nor lifetime trauma, but it was associated with the existence of childhood trauma. One of the key findings of our study is the demonstration that patients who remitted from their PTSD improved significantly their AUD severity, while patients who did not remit from their PTSD had no change in AUD severity.

PTSD evolution

To our knowledge, there are not previous longitudinal studies in rehabilitation center which include both posttraumatic stress disorder and alcohol use disorder inpatients. Nevertheless, some longitudinal studies focused on natural course of PTSD exist among other populations. Perkonigg and colleagues study focused on PTSD course in young adult (14-24 years old) in Germany. They found, after a follow-up of 34-50 months, 52% remitted case of PTSD. On the 48% of chronic PTSD they found a significant association with an avoidance symptom at PTSD baseline as well as anxiety and somatoform symptoms (Perkonigg et al., 2005). Most of studies are conducted on general population and despite of substantial variation in the definition of PTSD remission, most of them founded a mean 50% PTSD remission in the two-years follow-up (Morina et al., 2014; Rosellini et al., 2018; Steinert et al., 2015).

A meta-analysis interested in spontaneous PTSD remission (without any specific treatment) and found a 44% mean remission rate after 40-month follow-up (Morina et al., 2014). Our results show a higher remission rate (74.7%) than previous studies conducted on general

population with non-specific or undefined treatment during an 8 weeks hospitalization. These differences may be explained by the specific treatment conducted in our rehabilitation center.

Childhood trauma

Our results demonstrated that childhood traumas were predictors for a lower PTSD remission. According with prior studies, these results confirm that early-life trauma such as physical or sexual abuse constitute a vulnerability to PTSD (Dragan & Lis-Turlejska, 2007a; Huang et al., 2012; Kratzer et al., 2018) and alcohol use disorder (R. E. Norman et al., 2012; Schwandt et al., 2013).

Concerning the kind of trauma related to AUD our results are consistent with previous studies. Huang's study focused childhood trauma exposure, in alcohol use disorder inpatients on rehabilitation center found a childhood trauma prevalence of 55.1%. Specifically, the prevalence of physical abuse was 31.1 %, emotional abuse 21.4%, sexual abuse 24%, physical neglect 19.9% and emotional neglect 20.4%. This range of trauma was not in the same order than our study, we found at first emotional negligence before physical or sexual abuse. Concerning sexual abuse low rate in our study, they can be explained by the fact our population was made up mostly of men, which are statistically less exposed than women to sexual abuse (Dragan & Lis-Turlejska, 2007a).

Grundman and colleagues assessed the prevalence of traumatic experiences and PTSD in a large sample of inpatients treated for AUD. They also assessed trauma lived in adulthood that named "revictimization". They found a 13.2% PTSD prevalence with a 36.2% severe childhood physical or sexual abuse reported. Among them 45.6% reported at least one of these types of abuse in adulthood (Grundmann et al., 2017). These results are consistent with a PTSD vulnerability.

Emotional negligence was the first trauma founded in term of frequency in patient with non-remitted PTSD profile. Schwandt's study found that emotional negligence was found to be the primary predictor of AUD severity and found that physical abuse had also a direct effect on AUD severity but lower than emotional negligence. (Schwandt et al., 2013). A second study reported in the literature report a major part of emotional abuse often associated with other early trauma as physical and sexual abuse (Lotzin et al., 2016). This explanation of this association is that emotional negligence could lead to a high rate of neuroticism at adult age (Moskvina et al., 2007; Roy, 2002).

Emotional abuse is frequently met in development of other psychiatric disorder as major mood depression and bipolar disorder (Etain et al., 2010; Huang et al., 2012) . This notion of emotional maltreatment refers to the concept of insecure attachment developed by Bowlby explaining how a maltreatment given by a caregiver is linked to an insecure attachment and lead to many ranges of psychopathology as anxiety in adulthood (Bowlby, 1983). Other type of trauma is also well studied in literature and many of article concerning the association of childhood trauma with PTSD or AUD show a high association with physical abuse and sexual abuse (Huang et al., 2012; Müller et al., 2018). These results emphases the need to consider emotional trauma in addition to traumatic experiences that involve physical aspects.

Psychobiological explanations also support the hypothesis of stress vulnerability. Several studies underlined that early stressor can lead neurobiological change in mechanism of stress (De Bellis, 2001; Heim & Nemeroff, 2001). A recent study highlighted the positive association between vasovagal syncope in patients reported childhood trauma (also as sexual and physical abuse) and explain that "may result from paradoxical parasympathetic overdrive in response to a sympathetic increase in heart rate […] a Stress response may be decoupled from the original acute stressor" (O'Hare et al., 2017).

63

These results emphasis the importance of assessing childhood trauma among inpatients with comorbid PTSD-AUD hospitalized in rehabilitation center. Psychosocial interventions and treatments focusing on trauma-related symptoms and alcohol dependence may can constitute an interesting pathway of care to enhance the prognostic of this vulnerable population (Brady & Back, 2012).

Our secondary objective was to determine the association between PTSD remission at the end of their 3-months hospitalization and evolution with alcohol use disorder severity. Alcohol reduction only present in remitted PTSD subgroup. The association found between PTSD and AUD severity is in line with previous studies (Hingray, Cohn, et al., 2018; Kachadourian et al., 2018; McFall et al., 1992; Walton et al., 2018). The association between a more severe PTSD and AUD severity can be explained by the amnestic, anxiolytic and sedative properties of alcohol that may help these patients to cope with the intrusive PTSD symptoms or to avoid them (self-medication hypothesis) (Hruska et al., 2017).

Limitations

This study has several limitations. First, the diagnoses of alcohol use disorder and PTSD were all based on self-administered questionnaires rather than semi-structured interviews, and such an assessment increases the risk of false positives, due to possible declaration and memorization biases. One second limitation was constituted of our study population (hospitalized patients) that may differ from other patients with AUD and a comorbid PTSD, with a more severe addictive and psychiatric disorders severity than the overall population. This selection bias limits the generalizability of our findings. Finally, our study was conducted in a single center used to welcome patients with AUD and PTSD, and the psychosocial interventions conducted for each patient in our center may have impacted prevalence for PTSD remission.

Conclusion

We demonstrated that, in patients with AUD and a comorbid PTSD, the main factor associated with a poorer PTSD evolution was the history of childhood trauma, while the type of trauma encountered, or the initial severity of AUD had no impact on PTSD remission. We additionally found that patients who remitted from their PTSD at the end of their hospitalization exhibited a significant improvement in alcohol use disorder severity, while those who did not remit showed no improvement in AUD severity. These results highlight the importance to assess story of trauma during childhood to identify the most at risk subgroup between this populations. Integrative intervention focused on trauma (as EMDR or CBT) could be interesting (Sannibale et al., 2013; Schäfer et al., 2017b).

Table 1. Descriptive statistics of the PTSD sample at baseline (T1; n=91)

	Mean ± SD Percentage (number)
Socio-demographic characteristics at T1	
Age (years)	42.9 ± 8.6
Gender (male)	82.4% (85)
Marital status (married or in relationship)	36.3% (33)
Alcohol use disorder severity at T1 (AUDIT total score)	27.8 ± 7.7
PTSD severity at T1 (PCL-5 total score)	46.4 ± 10.9
Lifetime prevalence for a traumatic event (LEC)	
At least one traumatic event	100% (91)
Catastrophe (at least one)	46.2% (42)
Accident (at least one)	82.4% (75)
Physical assault (at least one)	82.4% (75)
Sexual assault (at least one)	23.1% (21)
War (at least one)	6.6% (6)
Death (at least one)	30.8% (28)
Any other traumatic event (at least one)	75.8% (69)
Childhood trauma (CTQ sub-scores)	
CTQ physical abuse score	8.31 ± 4.8
CTQ emotional abuse score	12.9 ± 5.9
CTQ sexual abuse score	6.8 ± 3.9
CTQ physical negligence score	8.9 ± 3.7
CTQ emotional negligence score	12.8 ± 5.0

Legends: Descriptive data are presented as mean ± standard deviation or percentage (number). * Refer from DSM-V criterias of PTSDAUDIT: Alcohol Use Disorder Identification Test; CTQ: Childhood Trauma Scale; LEC: Life Event Checklist based on DSM-5; PCL; PTSD: Post-Traumatic Stress Disorder; T1: Assessment at the first week of the admission.

Table 2. Baseline characteristics at T1 associated with PTSD remission at T2 in multiple logistic regressions after adjustment for age.

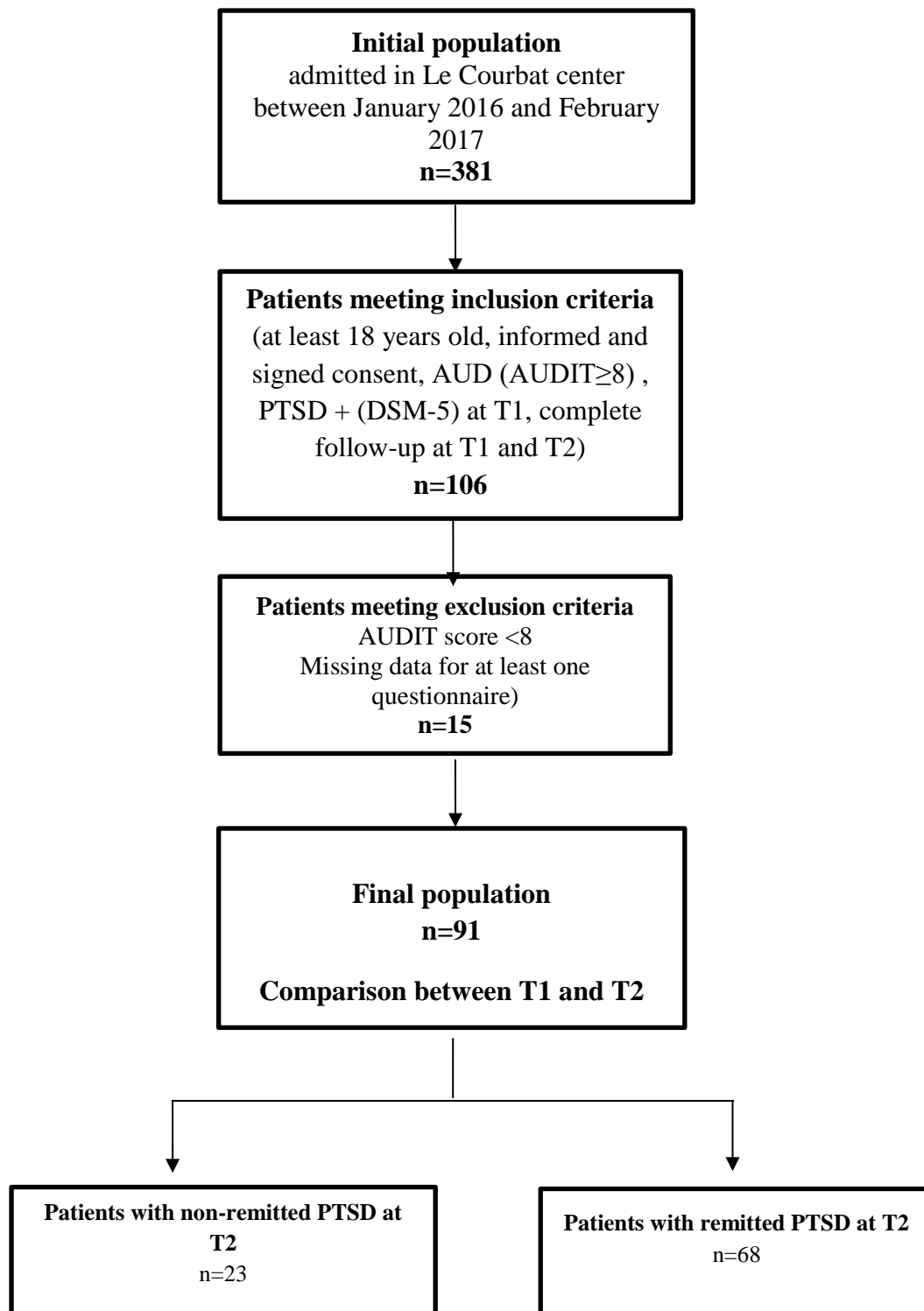|	Non-remitted PTSD at T2 (n=23)	Remitted PTSD at T2 (n=68)	Chi-squared	p-value	Odds-ratio	[CI 95%]
Sociodemographic characteristics						
Gender (male)	73.9% (17)	85.3% (58)	2.05	.15	.42	[.13 – 1.38]
Marital status (married or in a relationship)	26.1 % (6)	39.7% (27)	1.57	.21	.50	[.17 – 1.47]
Alcohol use disorder severity at T1 (AUDIT total score)	27.0 ± 7.3	28.0 ± 7.9	.46	.50	1.02	[.96 – 1.09]
PTSD severity at T1 (PCL-5 total score)	43.8 ± 8.8	47.3 ± 11.4	1.94	.16	1.03	[.99 – 1.08]
Life events (LEC)						
Catastrophe	43.5% (10)	47% (32)	.004	.95	.97	[.36 – 2.57]
Accidents	82.6% (19)	82.4% (56)	.08	.77	.83	[.23 – 3.02]
Physical assaults	78.3 % (18)	83.8% (57)	.49	.49	.65	[.19 – 2.18]
Sexual assaults	30.4% (7)	20.6% (14)	1.36	.24	1.88	[.65 – 5.41]
War	8.6% (2)	5.9 % (4)	1.200	.27	2.98	[.42 – 20.99]
Death	34.8% (8)	29.4% (20)	1.77	.18	2.05	[.71 – 5.91]
Any other traumatic event	78.3% (18)	75% (51)	.13	.72	1.24	[.23 – 3.02]
Childhood trauma (CTQ sub-scores)						
CTQ physical abuse*	10.7 ± 6.5	7.5 ± 3.8	7.4	.00*	.8741	[.79 – .96]
CTQ emotional abuse*	15.1 ± 6.2	12.1 ± 5.6	4.8	.03*	.91	[.84 – .99]
CTQ sexual abuse*	8.4 ± 6.1	6.2 ± 2.7	4.8	.03*	.88	[.78 – .99]
CTQ physical negligence*	10.3 ± 3.8	8.4 ± 3.2	4.05	.05*	.88	[.78 – .99]
CTQ emotional negligence	13.7 ± 6.1	12.5 ± 4.6	1.98	.16	.93	[.39 – 3.9]

Legends: Descriptive data are presented as mean ± standard deviation or percentage (number). We compared patients with remitted PTSD vs. non-remitted PTSD using mean comparison tests (Mann Whitney U test or Student's test) and chi-squared tests. * indicates the variables significantly associated with PTSD remission. . AUDIT: Alcohol Use Disorder Identification Test; CTQ: Childhood Trauma Scale; LEC: Life Event Checklist based on DSM-5 ; PCL: PTSD Checklist for DSM-5 ; PTSD: Post-Traumatic Stress Disorder ; T1: Assessment at the first week of the admission; ; T2: Assessment at the last week before the left (8 weeks after T1).

Table 3. Comparison of the evolution in alcohol use disorder severity between T1 and T2 in the whole sample and in patients with remitted and non-remitted PTSD (mixed models)

	T1	T2	Statistic test	*p*-value
AUDIT total scores in the whole sample	27.8 ± 7.7	25.6 ± 9.2	$F_{(1,90)}=1045.62$	<.001
AUDIT total scores in the subgroup "remitted PTSD"	28.0 ± 7.9	25.7 ± 9.6	$F_{(1,67)}=7.46$	.008
AUDIT total scores in the subgroup "non-remitted PTSD"	27.0 ± 7.3	25.4 ± 8.1	$F_{(1,22)}=2.46$	.13

Legend: Alcohol Use Disorder Inventory Test; PTSD: Post-Traumatic Stress Disorder. T1: Assessment at the first week of the admission; ; T2: Assessment at the last week before the left (8 weeks after T1).

Figure 1. Study flow-chart.

```
┌─────────────────────────────────┐
│        Initial population        │
│   admitted in Le Courbat center  │
│ between January 2016 and February│
│               2017               │
│             n=381                │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Patients meeting inclusion       │
│           criteria               │
│  (at least 18 years old, informed│
│   and signed consent, AUD        │
│   (AUDIT≥8) , PTSD + (DSM-5) at   │
│   T1, complete follow-up at T1   │
│            and T2)               │
│             n=106                │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Patients meeting exclusion       │
│           criteria               │
│        AUDIT score <8            │
│   Missing data for at least one  │
│          questionnaire)          │
│             n=15                 │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│        Final population          │
│             n=91                 │
│                                  │
│   Comparison between T1 and T2   │
└─────────────────────────────────┘
          │            │
          ▼            ▼
┌──────────────────┐  ┌──────────────────┐
│ Patients with    │  │ Patients with    │
│ non-remitted PTSD│  │ remitted PTSD at │
│ at T2            │  │ T2               │
│ n=23             │  │ n=68             │
└──────────────────┘  └──────────────────┘
```

Legends: AUDIT: Alcohol Use Disorder Identification Test; PTSD: Posttraumatic stress disorder. T1: Assessment at the first week of the admission; T2: Assessment at the last week before the left (8 weeks after T1).

CONCLUSION

Le trouble de stress posttraumatique est une réalité clinique non négligeable chez les patients hospitalisés pour un trouble d'usage d'alcool au sein des centres de soins et de réhabilitation en addictologie. Les vulnérabilités intrinsèques de ces patients tels que les traumatismes infantiles sont fréquemment retrouvés en clinique et constituent une fragilité face au stress se traduisant par des difficultés à faire-face à l'adversité. Le dysfonctionnement adaptatif s'associe souvent à des consommations de substances psychoactives comme l'alcool, jouant ainsi le rôle de médiateur entre le stress et les émotions. Les travaux présentés dans cette thèse démontrent que la sévérité du trouble de stress post-traumatique est corrélée à la sévérité de la consommation d'alcool, ainsi que d'autres troubles addictifs (tabagisme, addiction à l'alimentation).

Il semble envisageable que d'autres facteurs de vulnérabilité puissent également fragiliser les patients porteur d'un TSDT comorbide d'un trouble d'usage d'alcool voir d'autres addictions. Il serait donc intéressant d'étudier la présence d'autres comorbidités psychiatriques ayant un potentiel impact dans la gestion émotionnelle ; comme le trouble d'hyperactivité avec ou sans déficit de l'attention (TDA/H) présent dans l'enfance voir résiduel à l'âge adulte.

Pour conclure, il conviendrait d'être exhaustif dans la recherche des comorbidités associées psychiatriques et addictologiques de cette population vulnérable ; afin de proposer des prises en charges intégrées et idéalement individualisées favorisant ainsi la réduction des risques et des dommages pour tendre vers un mieux-être persistant de ces patients.

REFERENCES

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders: Dsm-5* (5th Revised edition). Washington, D.C: American Psychiatric Association Publishing.

Ashbaugh, A. R., Houle-Johnson, S., Herbert, C., El-Hage, W., & Brunet, A. (2016). Psychometric Validation of the English and French Versions of the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). *PloS One*, *11*(10), e0161645. https://doi.org/10.1371/journal.pone.0161645

Bailey, J. A., & McCloskey, L. A. (2005). Pathways to adolescent substance use among sexually abused girls. *Journal of Abnormal Child Psychology*, *33*(1), 39–53.

Ballenger, J. F., Best, S. R., Metzler, T. J., Wasserman, D. A., Mohr, D. C., Liberman, A., … Marmar, C. R. (2011). Patterns and predictors of alcohol use in male and female urban police officers. *The American Journal on Addictions*, *20*(1), 21–29. https://doi.org/10.1111/j.1521-0391.2010.00092.x

Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., … Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *The American Journal of Psychiatry*, *151*(8), 1132–1136. https://doi.org/10.1176/ajp.151.8.1132

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *Journal of Traumatic Stress*, *28*(6), 489–498. https://doi.org/10.1002/jts.22059

Bonn-Miller, M. O., Vujanovic, A. A., Boden, M. T., & Gross, J. J. (2011). Posttraumatic stress, difficulties in emotion regulation, and coping-oriented marijuana use. *Cognitive Behaviour Therapy*, *40*(1), 34–44. https://doi.org/10.1080/16506073.2010.525253

Bouju, G., Grall-Bronnec, M., Landreat-Guillou, M., & Venisse, J.-L. (2011). Jeu pathologique : facteurs impliqués. *L'Encéphale*, *37*(4), 322–331. https://doi.org/10.1016/j.encep.2011.01.003

Bowlby, J. (1983). *Attachment: Attachment and Loss Volume One(Basic Books Classics)* (2nd edition). New York: Basic Books.

Brady, K. T., & Back, S. E. (2012). Childhood trauma, posttraumatic stress disorder, and alcohol dependence. *Alcohol Research: Current Reviews*, *34*(4), 408–413.

Bremner, J. D., Southwick, S. M., Darnell, A., & Charney, D. S. (1996). Chronic PTSD in Vietnam combat veterans: course of illness and substance abuse. *The American Journal of Psychiatry*, *153*(3), 369–375. https://doi.org/10.1176/ajp.153.3.369

Brunault, P., Salamé, E., Jaafari, N., Courtois, R., Réveillère, C., Silvain, C., … Ballon, N. (2015). Why do liver transplant patients so often become obese? The addiction transfer hypothesis. *Medical Hypotheses*, *85*(1), 68–75.

Bujarski, S. J., Feldner, M. T., Lewis, S. F., Babson, K. A., Trainor, C. D., Leen-Feldner, E., … Bonn-Miller, M. O. (2012). Marijuana use among traumatic event-exposed adolescents: posttraumatic stress symptom frequency predicts coping motivations for use. *Addictive Behaviors*, *37*(1), 53–59. https://doi.org/10.1016/j.addbeh.2011.08.009

Caillon, J., Grall-Bronnec, M., Hardouin, J.-B., Venisse, J.-L., & Challet-Bouju, G. (2015). Online gambling's moderators: how effective? Study protocol for a randomized controlled trial. *BMC Public Health*, *15*, 519. https://doi.org/10.1186/s12889-015-1846-7

Carlier, I. V., Lamberts, R. D., & Gersons, B. P. (1997). Risk factors for posttraumatic stress

symptomatology in police officers: a prospective analysis. *The Journal of Nervous and*

Mental Disease, *185*(8), 498–506.

Chapman, C., Mills, K., Slade, T., McFarlane, A. C., Bryant, R. A., Creamer, M., … Teesson,

M. (2012). Remission from post-traumatic stress disorder in the general population.

Psychological Medicine, *42*(8), 1695–1703.

https://doi.org/10.1017/S0033291711002856

Chilcoat, H. D., & Breslau, N. (1998). Posttraumatic stress disorder and drug disorders:

testing causal pathways. *Archives of General Psychiatry*, *55*(10), 913–917.

Collignon, O., Girard, S., Gosselin, F., Saint-Amour, D., Lepore, F., & Lassonde, M. (2010).

Women process multisensory emotion expressions more efficiently than men.

Neuropsychologia, *48*(1), 220–225.

https://doi.org/10.1016/j.neuropsychologia.2009.09.007

Davidson, A. C., & Moss, S. A. (2008). Examining the Trauma Disclosure of Police Officers

to Their Partners and Officers' Subsequent Adjustment. *Journal of Language and*

Social Psychology, *27*(1), 51–70. https://doi.org/10.1177/0261927X07309511

De Bellis, M. D. (2001). Developmental traumatology: the psychobiological development of

maltreated children and its implications for research, treatment, and policy.

Development and Psychopathology, *13*(3), 539–564.

Del Pino-Gutiérrez, A., Fernández-Aranda, F., Granero, R., Tárrega, S., Valdepérez, A.,

Agüera, Z., … Jiménez-Murcia, S. (2017). Impact of alcohol consumption on clinical

aspects of gambling disorder. *International Journal of Mental Health Nursing*, *26*(2),

121–128. https://doi.org/10.1111/inm.12221

Dragan, M., & Lis-Turlejska, M. (2007a). Lifetime exposure to potentially traumatic events in a sample of alcohol-dependent patients in Poland. *Journal of Traumatic Stress*, *20*(6), 1041–1051. https://doi.org/10.1002/jts.20259

Dragan, M., & Lis-Turlejska, M. (2007b). Prevalence of posttraumatic stress disorder in alcohol dependent patients in Poland. *Addictive Behaviors*, *32*(5), 902–911. https://doi.org/10.1016/j.addbeh.2006.06.025

Etain, B., Mathieu, F., Henry, C., Raust, A., Roy, I., Germain, A., … Bellivier, F. (2010). Preferential association between childhood emotional abuse and bipolar disorder. *Journal of Traumatic Stress*, *23*(3), 376–383. https://doi.org/10.1002/jts.20532

Etter, J. F., Duc, T. V., & Perneger, T. V. (1999). Validity of the Fagerström test for nicotine dependence and of the Heaviness of Smoking Index among relatively light smokers. *Addiction (Abingdon, England)*, *94*(2), 269–281.

Evren, C., Sar, V., Dalbudak, E., Cetin, R., Durkaya, M., Evren, B., & Celik, S. (2011). Lifetime PTSD and quality of life among alcohol-dependent men: impact of childhood emotional abuse and dissociation. *Psychiatry Research*, *186*(1), 85–90. https://doi.org/10.1016/j.psychres.2010.07.004

Fagerström, K. O. (1978). Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. *Addictive Behaviors*, *3*(3–4), 235–241.

Ferris, J., & Wynne, H. (2001). The Canadian Problem Gambling Inventory. *Canadian Consortium for Gambling Research*, 1–59.

Flint, A. J., Gearhardt, A. N., Corbin, W. R., Brownell, K. D., Field, A. E., & Rimm, E. B. (2014). Food-addiction scale measurement in 2 cohorts of middle-aged and older women. *The American Journal of Clinical Nutrition*, *99*(3), 578–586. https://doi.org/10.3945/ajcn.113.068965

Gache, P., Michaud, P., Landry, U., Accietto, C., Arfaoui, S., Wenger, O., & Daeppen, J.-B. (2005). The Alcohol Use Disorders Identification Test (AUDIT) as a screening tool for excessive drinking in primary care: reliability and validity of a French version. *Alcoholism, Clinical and Experimental Research*, *29*(11), 2001–2007.

Gearhardt, A. N., Corbin, W. R., & Brownell, K. D. (2009). Food addiction: an examination of the diagnostic criteria for dependence. *Journal of Addiction Medicine*, *3*(1), 1–7. https://doi.org/10.1097/ADM.0b013e318193c993

Gielen, N., Havermans, R. C., Tekelenburg, M., & Jansen, A. (2012). Prevalence of post-traumatic stress disorder among patients with substance use disorder: it is higher than clinicians think it is. *European Journal of Psychotraumatology*, *3*. https://doi.org/10.3402/ejpt.v3i0.17734

Grundmann, J., Lincoln, T. M., Lüdecke, D., Bong, S., Schulte, B., Verthein, U., & Schäfer, I. (2017). Traumatic Experiences, Revictimization and Posttraumatic Stress Disorder in German Inpatients Treated for Alcohol Dependence. *Substance Use & Misuse*, 1–9. https://doi.org/10.1080/10826084.2017.1361997

Hartley, T. A., Violanti, J. M., Sarkisian, K., Andrew, M. E., & Burchfiel, C. M. (2013). PTSD symptoms among police officers: associations with frequency, recency, and types of traumatic events. *International Journal of Emergency Mental Health*, *15*(4), 241–253.

Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, Correlates, Disability, and Comorbidity of DSM-IV Alcohol Abuse and Dependence in the United States: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, *64*(7), 830–842. https://doi.org/10.1001/archpsyc.64.7.830

Heim, C., & Nemeroff, C. B. (2001). The role of childhood trauma in the neurobiology of

mood and anxiety disorders: preclinical and clinical studies. *Biological Psychiatry*,

49(12), 1023–1039.

Hingray, C., Cohn, A., Martini, H., Donné, C., El-Hage, W., Schwan, R., & Paille, F. (2018).

Impact of trauma on addiction and psychopathology profile in alcohol-dependent

women. *European Journal of Trauma & Dissociation*, *2*(2), 101–107.

https://doi.org/10.1016/j.ejtd.2018.02.001

Hingray, C., Donné, C., Martini, H., Cohn, A., El Hage, W., Schwan, R., & Paille, F. (2018).

Description of type of trauma in alcohol-dependent women. *European Journal of

Trauma & Dissociation*. https://doi.org/10.1016/j.ejtd.2018.01.001

Hruska, B., Pacella, M. L., George, R. L., & Delahanty, D. L. (2017). The association

between daily PTSD symptom severity and alcohol-related outcomes in recent

traumatic injury victims. *Psychology of Addictive Behaviors: Journal of the Society of

Psychologists in Addictive Behaviors*, *31*(3), 326–335.

https://doi.org/10.1037/adb0000262

Huang, M.-C., Schwandt, M. L., Ramchandani, V. A., George, D. T., & Heilig, M. (2012).

Impact of multiple types of childhood trauma exposure on risk of psychiatric

comorbidity among alcoholic inpatients. *Alcoholism, Clinical and Experimental

Research*, *36*(6), 1099–1107. https://doi.org/10.1111/j.1530-0277.2011.01695.x

Kachadourian, L. K., Gandelman, E., Ralevski, E., & Petrakis, I. L. (2018). Suicidal ideation

in military veterans with alcohol dependence and PTSD: The role of hostility. *The

American Journal on Addictions*, *27*(2), 124–130. https://doi.org/10.1111/ajad.12688

Kelly, M. M., Jensen, K. P., & Sofuoglu, M. (2015). Co-occurring tobacco use and

posttraumatic stress disorder: Smoking cessation treatment implications. *The

American Journal on Addictions*, *24*(8), 695–704. https://doi.org/10.1111/ajad.12304

Kessler, R. C. (2000). Posttraumatic stress disorder: the burden to the individual and to society. *The Journal of Clinical Psychiatry*, *61 Suppl 5*, 4–12.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 593–602. https://doi.org/10.1001/archpsyc.62.6.593

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, *52*(12), 1048–1060.

Konkolÿ Thege, B., Hodgins, D. C., & Wild, T. C. (2016). Co-occurring substance-related and behavioral addiction problems: A person-centered, lay epidemiology approach. *Journal of Behavioral Addictions*, *5*(4), 614–622. https://doi.org/10.1556/2006.5.2016.079

Kratzer, L., Heinz, P., Schennach, R., Schiepek, G. K., Padberg, F., & Jobst, A. (2018). [Inpatient Treatment of Complex PTSD Following Childhood Abuse: Effectiveness and Predictors of Treatment Outcome]. *Psychotherapie, Psychosomatik, Medizinische Psychologie*. https://doi.org/10.1055/a-0591-3962

Ledgerwood, D. M., & Petry, N. M. (2006). Posttraumatic stress disorder symptoms in treatment-seeking pathological gamblers. *Journal of Traumatic Stress*, *19*(3), 411–416. https://doi.org/10.1002/jts.20123

Legleye, S., Kraus, L., Piontek, D., Phan, O., & Jouanne, C. (2012). Validation of the Cannabis Abuse Screening Test in a sample of cannabis inpatients. *European Addiction Research*, *18*(4), 193–200. https://doi.org/10.1159/000336553

Leino, T., Eskelinen, K., Summala, H., & Virtanen, M. (2011). Work-Related Violence, Debriefing and Increased Alcohol Consumption among Police Officers. *International*

Journal of Police Science & Management, *13*, 149–157.

https://doi.org/10.1350/ijps.2011.13.2.229

Lotzin, A., Haupt, L., von Schönfels, J., Wingenfeld, K., & Schäfer, I. (2016). Profiles of

Childhood Trauma in Patients with Alcohol Dependence and Their Associations with

Addiction-Related Problems. *Alcoholism, Clinical and Experimental Research*, *40*(3),

543–552. https://doi.org/10.1111/acer.12990

Marmar, C. R., McCaslin, S. E., Metzler, T. J., Best, S., Weiss, D. S., Fagan, J., … Neylan, T.

(2006). Predictors of posttraumatic stress in police and other first responders. *Annals

of the New York Academy of Sciences*, *1071*, 1–18.

https://doi.org/10.1196/annals.1364.001

Mason, S. M., Flint, A. J., Roberts, A. L., Agnew-Blais, J., Koenen, K. C., & Rich-Edwards,

J. W. (2014). Posttraumatic stress disorder symptoms and food addiction in women by

timing and type of trauma exposure. *JAMA Psychiatry*, *71*(11), 1271–1278.

https://doi.org/10.1001/jamapsychiatry.2014.1208

McCarthy, E., & Petrakis, I. (2010). Epidemiology and management of alcohol dependence in

individuals with post-traumatic stress disorder. *CNS Drugs*, *24*(12), 997–1007.

https://doi.org/10.2165/11539710-000000000-00000

McCauley, J. L., Killeen, T., Gros, D. F., Brady, K. T., & Back, S. E. (2012). Posttraumatic

Stress Disorder and Co-Occurring Substance Use Disorders: Advances in Assessment

and Treatment. *Clinical Psychology (New York)*, *19*(3).

https://doi.org/10.1111/cpsp.12006

McFall, M. E., Mackay, P. W., & Donovan, D. M. (1992). Combat-related posttraumatic

stress disorder and severity of substance abuse in Vietnam veterans. *Journal of Studies

on Alcohol*, *53*(4), 357–363.

Mitchell, K. S., & Wolf, E. J. (2016). PTSD, food addiction, and disordered eating in a sample of primarily older veterans: The mediating role of emotion regulation. *Psychiatry Research*, *243*, 23–29. https://doi.org/10.1016/j.psychres.2016.06.013

Moran, P. B., Vuchinich, S., & Hall, N. K. (2004). Associations between types of maltreatment and substance use during adolescence. *Child Abuse & Neglect*, *28*(5), 565–574. https://doi.org/10.1016/j.chiabu.2003.12.002

Morina, N., Wicherts, J. M., Lobbrecht, J., & Priebe, S. (2014). Remission from post-traumatic stress disorder in adults: a systematic review and meta-analysis of long term outcome studies. *Clinical Psychology Review*, *34*(3), 249–255. https://doi.org/10.1016/j.cpr.2014.03.002

Moskvina, V., Farmer, A., Swainson, V., O'Leary, J., Gunasinghe, C., Owen, M., … Korszun, A. (2007). Interrelationship of childhood trauma, neuroticism, and depressive phenotype. *Depression and Anxiety*, *24*(3), 163–168. https://doi.org/10.1002/da.20216

Müller, M., Ajdacic-Gross, V., Rodgers, S., Kleim, B., Seifritz, E., Vetter, S., … Vandeleur, C. (2018). Predictors of remission from PTSD symptoms after sexual and non-sexual trauma in the community: A mediated survival-analytic approach. *Psychiatry Research*, *260*, 262–271. https://doi.org/10.1016/j.psychres.2017.11.068

Najavits, L. m. (2005). Theoretical perspective on posttraumatic stress disorder and substance use disorder. *Australian Psychologist*, *40*(2), 118–126. https://doi.org/10.1080/00050060500094621

Nayak, M. B., Lown, E. A., Bond, J. C., & Greenfield, T. K. (2012). Lifetime victimization and past year alcohol use in a U.S. population sample of men and women drinkers. *Drug and Alcohol Dependence*, *123*(1–3), 213–219. https://doi.org/10.1016/j.drugalcdep.2011.11.016

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. *PLoS Medicine*, *9*(11), e1001349. https://doi.org/10.1371/journal.pmed.1001349

Norman, S. B., Haller, M., Hamblen, J. L., Southwick, S. M., & Pietrzak, R. H. (2018). The burden of co-occurring alcohol use disorder and PTSD in U.S. Military veterans: Comorbidities, functioning, and suicidality. *Psychology of Addictive Behaviors*, *32*(2), 224–229. https://doi.org/10.1037/adb0000348

O'Hare, C., McCrory, C., O'Leary, N., O'Brien, H., & Kenny, R. A. (2017). Childhood trauma and lifetime syncope burden among older adults. *Journal of Psychosomatic Research*, *97*, 63–69. https://doi.org/10.1016/j.jpsychores.2017.03.019

Ouimette, P., Read, J. P., Wade, M., & Tirone, V. (2010). Modeling associations between posttraumatic stress symptoms and substance use. *Addictive Behaviors*, *35*(1), 64–67. https://doi.org/10.1016/j.addbeh.2009.08.009

Paquette, D., Laporte, L., Bigras, M., & Zoccolillo, M. (2004). [Validation of the French version of the CTQ and prevalence of the history of maltreatment]. *Sante Mentale Au Quebec*, *29*(1), 201–220.

Perkonigg, A., Pfister, H., Stein, M. B., Höfler, M., Lieb, R., Maercker, A., & Wittchen, H.-U. (2005). Longitudinal course of posttraumatic stress disorder and posttraumatic stress disorder symptoms in a community sample of adolescents and young adults. *The American Journal of Psychiatry*, *162*(7), 1320–1327. https://doi.org/10.1176/appi.ajp.162.7.1320

Petrakis, I. L., & Simpson, T. L. (2017). Posttraumatic Stress Disorder and Alcohol Use Disorder: A Critical Review of Pharmacologic Treatments. *Alcoholism, Clinical and Experimental Research*, *41*(2), 226–237. https://doi.org/10.1111/acer.13297

Philippe, J.-M., Brahic, O., Carli, P., Tourtier, J.-P., Riou, B., & Vallet, B. (2016). French

    Ministry of Health's response to Paris attacks of 13 November 2015. *Critical Care*

    (London, England), *20*, 85. https://doi.org/10.1186/s13054-016-1259-8

Possemato, K., Maisto, S. A., Wade, M., Barrie, K., Johnson, E. M., & Ouimette, P. C.

    (2017). Natural Course of Co-Occurring PTSD and Alcohol Use Disorder Among

    Recent Combat Veterans. *Journal of Traumatic Stress*, *30*(3), 279–287.

    https://doi.org/10.1002/jts.22192

Pursey, K. M., Stanwell, P., Gearhardt, A. N., Collins, C. E., & Burrows, T. L. (2014). The

    prevalence of food addiction as assessed by the Yale Food Addiction Scale: a

    systematic review. *Nutrients*, *6*(10), 4552–4590. https://doi.org/10.3390/nu6104552

Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J.

    (2009). Global burden of disease and injury and economic cost attributable to alcohol

    use and alcohol-use disorders. *Lancet*, *373*(9682), 2223–2233.

    https://doi.org/10.1016/S0140-6736(09)60746-7

Rosellini, A. J., Liu, H., Petukhova, M. V., Sampson, N. A., Aguilar-Gaxiola, S., Alonso, J.,

    … Kessler, R. C. (2018). Recovery from DSM-IV post-traumatic stress disorder in the

    WHO World Mental Health surveys. *Psychological Medicine*, *48*(3), 437–450.

    https://doi.org/10.1017/S0033291717001817

Roy, A. (2002). Childhood trauma and neuroticism as an adult: possible implication for the

    development of the common psychiatric disorders and suicidal behaviour.

    Psychological Medicine, *32*(8), 1471–1474.

S. Ménard, K., & L. Arter, M. (2013). Police Officer Alcohol Use and Trauma Symptoms:

    Associations With Critical Incidents, Coping, and Social Stressors. *International*

    Journal of Stress Management, *20*, 37. https://doi.org/10.1037/a0031434

Sannibale, C., Teesson, M., Creamer, M., Sitharthan, T., Bryant, R. A., Sutherland, K., … Peek-O'Leary, M. (2013). Randomized controlled trial of cognitive behaviour therapy for comorbid post-traumatic stress disorder and alcohol use disorders. *Addiction*, *108*(8), 1397–1410. https://doi.org/10.1111/add.12167

Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. *Addiction (Abingdon, England)*, *88*(6), 791–804.

Schäfer, I., Chuey-Ferrer, L., Hofmann, A., Lieberman, P., Mainusch, G., & Lotzin, A. (2017a). Effectiveness of EMDR in patients with substance use disorder and comorbid PTSD: study protocol for a randomized controlled trial. *BMC Psychiatry*, *17*(1), 95. https://doi.org/10.1186/s12888-017-1255-9

Schäfer, I., Chuey-Ferrer, L., Hofmann, A., Lieberman, P., Mainusch, G., & Lotzin, A. (2017b). Effectiveness of EMDR in patients with substance use disorder and comorbid PTSD: study protocol for a randomized controlled trial. *BMC Psychiatry*, *17*(1), 95. https://doi.org/10.1186/s12888-017-1255-9

Schwandt, M. L., Heilig, M., Hommer, D. W., George, D. T., & Ramchandani, V. A. (2013). Childhood trauma exposure and alcohol dependence severity in adulthood: mediation by emotional abuse severity and neuroticism. *Alcoholism, Clinical and Experimental Research*, *37*(6), 984–992. https://doi.org/10.1111/acer.12053

Spinhoven, P., Penninx, B. W., van Hemert, A. M., de Rooij, M., & Elzinga, B. M. (2014). Comorbidity of PTSD in anxiety and depressive disorders: prevalence and shared risk factors. *Child Abuse & Neglect*, *38*(8), 1320–1330. https://doi.org/10.1016/j.chiabu.2014.01.017

Steenkamp, M. M., Blessing, E. M., Galatzer-Levy, I. R., Hollahan, L. C., & Anderson, W. T. (2017). Marijuana and other cannabinoids as a treatment for posttraumatic stress disorder: A literature review. *Depression and Anxiety*, *34*(3), 207–216. https://doi.org/10.1002/da.22596

Steffen, K. J., Engel, S. G., Wonderlich, J. A., Pollert, G. A., & Sondag, C. (2015). Alcohol and other addictive disorders following bariatric surgery: prevalence, risk factors and possible etiologies. *European Eating Disorders Review*, *23*(6), 442–450.

Steinert, C., Hofmann, M., Leichsenring, F., & Kruse, J. (2015). The course of PTSD in naturalistic long-term studies: high variability of outcomes. A systematic review. *Nordic Journal of Psychiatry*, *69*(7), 483–496. https://doi.org/10.3109/08039488.2015.1005023

Stewart, S. H., Pihl, R. O., Conrod, P. J., & Dongier, M. (1998). Functional associations among trauma, PTSD, and substance-related disorders. *Addictive Behaviors*, *23*(6), 797–812.

Swatt, M. L., Gibson, C. L., & Piquero, N. L. (2007). Exploring the utility of general strain theory in explaining problematic alcohol consumption by police officers. *Journal of Criminal Justice*, *35*(6), 596–611. https://doi.org/10.1016/j.jcrimjus.2007.09.005

Taylor, M., Petrakis, I., & Ralevski, E. (2017). Treatment of alcohol use disorder and co-occurring PTSD. *The American Journal of Drug and Alcohol Abuse*, *43*(4), 391–401. https://doi.org/10.1080/00952990.2016.1263641

Tonmyr, L., Thornton, T., Draca, J., & Wekerle, C. (2010). A Review of Childhood Maltreatment and Adolescent Substance Use Relationship. *Current Psychiatry Reviews*, *6*, 223–234. https://doi.org/10.2174/157340010791792581

Tubman, J. G., Oshri, A., Taylor, H. L., & Morris, S. L. (2011). Maltreatment clusters among youth in outpatient substance abuse treatment: co-occurring patterns of psychiatric

symptoms and sexual risk behaviors. *Archives of Sexual Behavior*, *40*(2), 301–309. https://doi.org/10.1007/s10508-010-9699-8

Vujanovic, A. A., Marshall-Berenz, E. C., & Zvolensky, M. J. (2011). Posttraumatic Stress and Alcohol Use Motives: A Test of the Incremental and Mediating Role of Distress Tolerance. *Journal of Cognitive Psychotherapy*, *25*(2), 130–141. https://doi.org/10.1891/0889-8391.25.2.130

Waldrop, A. E., & Cohen, B. E. (2014). Trauma exposure predicts alcohol, nicotine, and drug problems beyond the contribution of PTSD and depression in patients with cardiovascular disease: data from the Heart and Soul Study. *The American Journal on Addictions*, *23*(1), 53–61. https://doi.org/10.1111/j.1521-0391.2013.12053.x

Walsh, K., Elliott, J. C., Shmulewitz, D., Aharonovich, E., Strous, R., Frisch, A., … Hasin, D. (2014). Trauma exposure, posttraumatic stress disorder and risk for alcohol, nicotine, and marijuana dependence in Israel. *Comprehensive Psychiatry*, *55*(3), 621–630. https://doi.org/10.1016/j.comppsych.2013.11.016

Walton, J. L., Raines, A. M., Cuccurullo, L.-A. J., Vidaurri, D. N., Villarosa-Hurlocker, M. C., & Franklin, C. L. (2018). The relationship between DSM-5 PTSD symptom clusters and alcohol misuse among military veterans. *The American Journal on Addictions*, *27*(1), 23–28. https://doi.org/10.1111/ajad.12658

Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). The life events checklist for DSM-5 (LEC-5). *Instrument Available from the National Center for PTSD at Www. Ptsd. va. Gov*.

Wittchen, H. U., Jacobi, F., Rehm, J., Gustavsson, A., Svensson, M., Jönsson, B., … Steinhausen, H.-C. (2011). The size and burden of mental disorders and other disorders of the brain in Europe 2010. *European Neuropsychopharmacology*, *21*(9), 655–679. https://doi.org/10.1016/j.euroneuro.2011.07.018

Vu, le Directeur de Thèse

Vu, le Doyen

de la Faculté de médecine de TOURS

LEBIGRE Kévin

87 pages – 8 tableaux – 2 figures

Résumé : Contexte : Si le trouble de stress post-traumatique (TSPT) est fortement associé aux addictions, la plupart des études se sont focalisées sur une addiction en particulier, notamment sur le seul trouble de l'usage en alcool=TUA. De plus, peu ont investigué le lien entre amélioration du TSPT et amélioration des addictions. Cette thèse article avait deux objectifs : (1) évaluer le lien entre TSPT et différents troubles addictifs (alcool, tabac, cannabis, jeu d'argent pathologique, alimentation) chez des fonctionnaires de polices hospitalisés pour un TUA (article 1) ; (2) préciser, parmi les patients ayant un TSPT en début d'hospitalisation, combien étaient en rémission en fin d'hospitalisation, quels étaient les facteurs associés à cette rémission. **Méthode :** Cette étude mono-centrique (centre de Soins de Suite et de Réadaptation en Addictologie du Courbat, Indre-et-Loire, menée entre Janvier 2016 et Février 2017) et longitudinale comportait deux temps d'évaluation : après une semaine d'hospitalisation (T1) et en fin d'hospitalisation (T2= 2 mois après T1). Des auto-questionnaires administrés à T1 et T2 ont permis d'évaluer les variables sociodémographiques, les troubles addictifs (AUDIT, Fagerström, CAST, mYFAS, ICJE) et la sévérité et le type de TSPT (LEC-5, PCL-5, CTQ). **Résultats :** Étude 1 (transversale, fonctionnaires de police ayant un TUA, n=133) : Le trouble de stress-posttraumatique était fortement prévalent chez les fonctionnaires de police hospitalisés pour un TUA (38.3%). Le TSPT était associé à un TUA plus sévère et à une prévalence plus élevée de trouble de l'usage du tabac et d'addiction à l'alimentation, mais pas de trouble lié à l'usage de cannabis ou de jeu d'argent pathologique. Étude 2 (longitudinale, patients ayant un TSPT à T1 et suivis à T2, n=91) : le taux de rémission du TSPT (amélioration d'au moins 30% du score CAPS entre T1 et T2) au cours de l'hospitalisation était de 74.7%. Les facteurs prédicteurs d'une moins bonne évolution du TSPT (absence de rémission) étaient l'existence de traumatismes infantiles, mais pas le type de traumatismes, l'intensité du TSPT, ni la sévérité initiale du TUA. Une rémission du TSPT était associée à une amélioration de la sévérité du TUA, tandis que l'absence de rémission était associée à une absence d'amélioration de la sévérité du TUA. **Conclusion :** Il est fondamental de dépister et prendre en charge le TSPT chez les patients souffrant de TUA et hospitalisés en SSR-A : ce trouble est associé à de nombreuses addictions (sévérité du TUA, tabac, alimentation), et son amélioration est associée à une amélioration de la sévérité du TUA. Parmi les patients souffrant de TSPT, ceux ayant des traumatismes infantiles ont la moins bonne évolution, soulignant l'intérêt d'une prise en charge spécifique de ces patients.
Mots clés : Trouble de stress post-traumatique ; Trouble de l'usage en alcool ; Addictions ; Traumatismes infantiles ; Facteurs prédicteurs ; Evolution ; Policiers

Jury :

Président du Jury :   Monsieur le Professeur Nicolas BALLON
Directeur de thèse :   Monsieur le Docteur Paul BRUNAULT
Membres du Jury :   Monsieur le Professeur WISSAM EL HAGE
                    Madame le Professeur Marie GRALL-BRONNEC
                    Monsieur le Docteur Damien MAUGE
                    Madame le Docteur Servane BARRAULT

Date de soutenance : 11 octobre 2018