EVALUATION OF THE QUALITY OF DRUG STORAGE CONDITIONS IN HOSPITAL WARDS REFRIGERATORS

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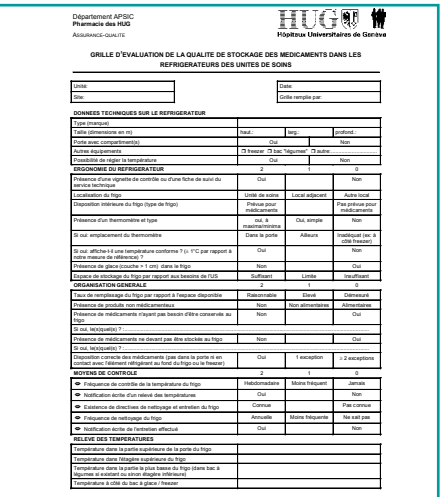
BACKGROUND

Quality assurance programmes for medication storage in refrigerator have been developped earlier[1]. However recent studies[2-3] found that 4.5 to 30 % of refrigerators in wards were too warm or too cold, and that vaccines were inappropriately stored on the door shelf in 46% of the cases. The objective of our study was to validate an evaluation grid for storage conditions quality in wards refrigerators, to measure the quality in a hospital department and to edit good practice guidelines.

METHOD

- Settings:
  25 refrigerators in 28 wards from Geriatrics Department (404 beds)
- Validation and evaluation:
  Wards were visited by two pharmacists who simultaneously filled in a standardized grid (Fig.1) allocating points to 18 questions (0,1 or 2 points: maximum 36 points) concerning the following criteria:
  - ❖ refrigerator's technical data
  - ❖ ergonomics (refrigerator stock) (16 points)
  - ❖ general organisation (10 points)
  - ❖ means of control (10 points)

  Measurement of internal refrigerator temperatures in different locations (door, up, middle, down shelves) were checked simultaneously with electronical thermometer probes (Elpro Ecolog®).



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GRILLE D'EVALUATION DE LA QUALITE DE STOCKAGE DES MEDICAMENTS DANS LES REFRIGERATEURS DES UNITES DE SOINS

Unité: | Date:
Site: | Grille remplie par:

DONNEES TECHNIQUES SUR LE REFRIGERATEUR

Type (marque):			
Taille (dimensions en m)	haut.:	larg.:	profond.:
Porte avec compartiment(s)	Oui		Non
Autres équipements	☐ freezer ☐ bac "légumes" ☐ autre:		
Possibilité de régler la température	Oui		Non
ERGONOMIE DU REFRIGERATEUR	2	1	0
Présence d'une vignette de contrôle ou d'une fiche de suivi du service technique	Oui		Non
Localisation du frigo	Unité de soins	Local adjacent	Autre local
Disposition intérieure du frigo (type de frigo)	Prévue pour médicaments		Pas prévue pour médicaments
Présence d'un thermomètre et type	oui, à maxima/minima	Oui, simple	Non
Si oui: emplacement du thermomètre	Dans la porte	Ailleurs	Inadéquat (sec à côté freezer)
Si oui: affiche-t-il une température conforme ? (≥ 1°C par rapport à votre mesure de référence) ?	Oui		Non
Présence de glace (couche > 1 cm) dans le frigo	Non		Oui
Espace de stockage du frigo par rapport aux besoins de l'US	Suffisant	Limite	Insuffisant
ORGANISATION GENERALE	2	1	0
Taux de remplissage du frigo par rapport à l'espace disponible	Raisonnable	Elevé	Démesuré
Présence de produits non médicamenteux	Non	Non alimentaire	Alimentaire
Présence de médicaments n'ayant pas besoin d'être conservés au frigo	Non		Oui
Si oui, lesquels(les) ?			
Présence de médicaments ne devant pas être stockés au frigo	Non		Oui
Si oui, lesquels(les) ?			
Disposition correcte des médicaments (pas dans la porte ni en contact avec l'élément réfrigérant au fond du frigo ou le freezer)	Oui	1 exception	≥ 2 exceptions
MOYENS DE CONTROLE	2	1	0
Fréquence de contrôle de la température du frigo	Hebdomadaire	Moins fréquent	Jamais
Notification écrite d'un relevé des températures	Oui		Non
Existence de directives de nettoyage et entretien du frigo	Connue		Pas connue
Fréquence de nettoyage du frigo	Annuelle	Moins fréquente	Ne sait pas
Notification écrite de l'entretien effectué	Oui		Non
RELEVE DES TEMPERATURES			
Température dans la partie supérieure de la porte du frigo			
Température dans l'étagère supérieure du frigo			
Température dans la partie la plus basse du frigo (dans bac à légumes si existant ou sinon étagère inférieure)			
Température à côté du bac à glace / freezer			

Fig 1. Evaluation grid for refrigerator stock quality

RESULTS

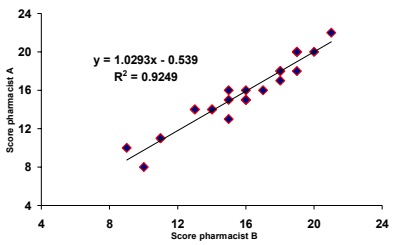

Fig 2. Overall score: correlation between the scores of pharmacists A and B

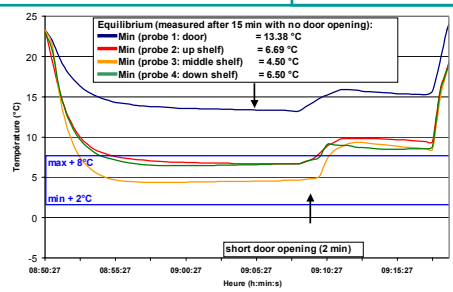

Fig 3. Sample of a conform temperatures measurement chart

- Validation: the correlation coefficient (r) between the 2 pharmacists was 0.925 (p=0.678) for the overall score (Fig.2).
- Evaluation: the average quality index was 16/36 (43%) ± 3.46 (SD) (min 8, max 22) for the 28 wards.
- Internal temperatures were conform (+2 to +8°C) in 6 (24%) refrigerators, 16 (64%) were to warm (+9 to +21°C) and 3 (12%) too cold (-1.4°C to +1°C).
- Temperature in the door shelves were always over 8°C
- Only two wards checked systematically the temperature of their refrigerator but almost all wards (except 3) had weekly cleaning guidelines.

CONCLUSIONS

- ❖ The agreement between the results obtained during the evaluation by the two pharmacists permitted the validation of the evaluation grid used to test the quality of drug storage in wards refrigerators.
- ❖ Averal global quality index was poor: unsuitable material (use of refrigerators designed to stock food rather than drugs) and lack of knowledge about good practices in storing drugs in refrigerator were main factors.
- ❖ Temperature in door shelves of a food designed refrigerator is too warm and should not be used to stock drugs.
- ❖ The grid can be used as a routine tool to measure and improve stock quality, with the ultimate aim of reducing the risk of inadequate storage of drugs needed to be refrigerated and poor quality of patient drug treatment.
- ❖ This study resulted in the elaboration and publication of guidelines on good practices of drug cold handling and storage.
- ❖ A new study will measure the impact of these guidelines.

REFERENCES (1) Jeffrey LP et al, Assuring the quality of medications stored in patient care areas, AJHP 1975;32:283-85 (2) Bishai DM et al, Vaccine storage practices in pediatric offices, Pediatrics 1992;89:193-96 (3) Bell KN et al, Risk factors for improper vaccine storage and handling in private provider offices, Pediatrics 2001;107:e100

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