[4] Gaucher S, Elie C, Vérola O, Jarraya M. Viability of cryopreserved human skin allografts: effects of transport media and cryoprotectant. Cell Tissue Bank 2012;13(1):147–55.
[5] Gaucher S, Jarraya M. Technical note: comparison of the PrestoBlue and LDH release assays with the MTT assay for skin viability assessment. Cell Tissue Bank 2014 [Epub ahead of print].

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http://dx.doi.org/10.1016/j.burns.2015.01.021

Reply

Response to Letter to the Editor: 'Human skin allografts: Storage medium at 4 °C and viability'

We appreciate the comments of Dr. Gaucher and colleagues on our recent paper [1]. We systematically used punch biopsies of 4 mm diameter to allow standardization of the skin sample area. Surface area of skin samples has been shown to highly correlate with the optical density (OD) when performing MTT assays [2,3]. In contrast, weight of the skin samples was found to correlate non-linearly [4]. This was confirmed by our own experiments (data not shown). Due to their relative abundance, keratinocytes from the epidermis contribute approximately 80% to the activity of skin samples when using MTT. Cellularity and activity in the dermis is much lower. Consequently, when thicker skin samples are used (e.g. 0.6 mm), the optical density hardly increases while the weight more than doubles (Table 1). As a result, the OD/g drastically decreases, while the viability should be the same instead. Based on the results above, we did not use weight correction in our report on viability measurements.

The viabilities in our study were higher compared to results in similar studies on RPMI, which might be related to small differences in the methods used to determine the cellular activity with MTT or to variation between donors. We did not observe differences between living and deceased donors, but the sample size was very small. Of note is the markedly reduced VI in studies where the storage medium was changed every 3 days [2,3] compared to those without medium change [1,4]. Whether this is related to leakage of electrolytes remains to be investigated. Therefore we recommend that the effect of medium change is investigated in future studies on preservation methods.

Table 1 – Skin viability as measured by MTT is greatly determined by keratinocytes.

Thickness[a]	OD_{560}	Weight (mg)	OD/g	Area (mm^2)	OD/mm^2
0.3 mm	0.43 ± 0.07	2.7 ± 0.6	168 ± 46	14 ± 1	0.031 ± 0.006
0.6 mm	0.47 ± 0.05	6.2 ± 1.7	82 ± 34	19 ± 2	0.025 ± 0.005
FT (≈3 mm)	0.72 ± 0.08	30.6 ± 4.2	24 ± 5	19 ± 2	0.039 ± 0.008

[a] Three skin biopsies of 4 mm in diameter from 1 donor were used. Similar trends were seen for 2 and 6 mm biopsies (data not shown).

REFERENCES

[1] Boekema BKHL, Boekestijn B, Breederveld RS. Evaluation of saline, RPMI and DMEM/F12 for storage of split-thickness skin grafts. Burns)2014;(November 15). http://dx.doi.org/10.1016/j.burns.2014.10.016. pii:S0305-4179(14)00352-0 [Epub ahead of print].
[2] Alotto D, Ariotti S, Graziano S, Verrua R, Stella M, Magliacani G, et al. The role of quality control in a skin bank: tissue viability determination. Cell Tissue Bank 2002;3:3–10.
[3] Castagnoli C, Alotto D, Cambieri I, Casimiri R, Aluffi M, Stella M, et al. Evaluation of donor skin viability: fresh and cryopreserved skin using tetrazolioum salt assay. Burns 2003;29:759–67.
[4] Gaucher S, Elie C, Verola O, Jarraya M. Viability of cryopreserved human skin allografts: effects of transport media and cryoprotectant. Cell Tissue Bank 2012;13:147–55.

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http://dx.doi.org/10.1016/j.burns.2015.02.013

Letter to the Editor

The late clinical and forensic symptoms and signs of sulfur mustard

Dear Editor,

We read Dinis-Oliveira and colleagues' article with great interest and enjoyed a lot [1]. Hereby, we would like to add some points to their invaluable paper. Sulfur mustard (SM) is

one of the most important vesicants causing chemical burns, and many Iranian soldiers were injured chemically due to SM exposure during Iraq–Iran war (1980–1988). Subsequently, 52,000 victims needed follow-up for their chemical injuries at the end of the war [2]. Studies showed that SM could lead to many early and late complications including respiratory, ocular, and dermatological disorders in exposed individuals [3]. Considering clinical and forensic symptoms and signs, and based on our previous research, some of the main delayed complications of SM were as follows.

Respiratory system: The frequency of long-term pulmonary involvement was about 42.5% among victims, and the most common symptoms were cough and dyspnea. The major respiratory complications were chronic obstructive pulmonary disease, bronchiectasis, and asthma [4,5].

Ocular system: Late complications consisted of chronic blepharitis, decreased tear meniscus, conjunctival vessel tortuosity, limbal stem cell deficiency, corneal scarring and thinning, and lipid/amyloid deposits. Permanent reduction in visual acuity or blindness occurred in 0.5% of severely injured patients [6].

Dermatological system: The most common symptom was itching, which was more frequent in women compared to men. Mustard scar, lipoma, and cherry angioma were reported at the site of exposure [7].

SM can cause psychological, immunological, and hematological disorders along with some indirect effects on societies, families, friends, and affiliates of the victims. They should be widely studied in the future.

Author contributions

Dr. Payman Salamati designed the idea, drafted the paper, and approved the version to be published. Dr. Seyed Mansour Razavi designed the idea, revised the paper critically, and approved the version to be published.

Conflicts of interest

None.

Role of the funding source

None.

Ethics committee approval

This paper has been prepared in accordance with the rules of the ethical review board of the Tehran University of Medical Sciences.

REFERENCES

[1] Dinis-Oliveira RJ, Carvalho F, Moreira R, Proença JB, Santos A, Duarte JA, et al. Clinical and forensic signs related to chemical burns: a mechanistic approach. Burns 2014. http://dx.doi.org/10.1016/j.burns.2014.09.002.

[2] Salamati P, Razavi SM, Shokraneh F, Mohazzab Torabi S, Laal M, Hadjati G, et al. Mortality and injuries among Iranians in Iraq–Iran war: a systematic review. Arch Iran Med 2013;16:542–50.

[3] Razavi SM, Salamati p, Karbaksh M. Preventive measures against the mustard gas: a review. Med J Islam Repub Iran 2013;27:83–90.

[4] Razavi SM, Salamati p, Amini Harandi A, Ghanei M. Prevention and treatment of respiratory consequences induced by sulfur mustard in Iranian casualties: a review. Int J Prev Med 2013;4:383–9.

[5] Razavi SM, Ghanei M, Salamati P, Safiabady M. Long-term effects of mustard gas on respiratory system of Iranian veterans after Iraq–Iran war: a review. Chin J Traumatol 2013;16:163–8.

[6] Razavi SM, Salamati P, Feizi S, Javadi MA. Mustard gas-induced ocular injuries: a review of manifestations and managements. Iran J Ophthalmol 2012;24:11–8.

[7] Razavi SM, Davoudi SM, Saghafinia M, Salamati P. Effects of sulfur mustard on the skin and their management: reviewing the studies conducted on Iranian chemical victims. Iran J Dermatol 2013;16:21–30.

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http://dx.doi.org/10.1016/j.burns.2015.03.006

Letter to the Editor

Management of melting graft syndrome: A call for evidence

Dear Sir,

Melting graft syndrome is a well established condition characterised by progressive epithelial loss from a previously well-taken skin graft, healed burn or donor site. Also known as ghosting graft syndrome or burn wound impetigo, the condition has largely been attributed to the effects of *Staphylococcus aureus* and its more virulent relation MRSA on newly epithelialising wounds. The resultant effect of this pathological burden is the appearance of patchy epithelial loss and a 'moth-eaten' graft.

Matsumura et al. coined the term melting-graft wound syndrome in 1998 [1], although descriptions of moth-eaten